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THE REVISION OF THE MEDICAL CURRICULUM *

ARTHUR DEAN BEVAN, M.D.

CHICAGO

In the last few years there has been among medical educators much discussion of the necessity or, at least, the desirability of revising the medical curriculum. During the last year I have made this matter the subject of a special study, and shall present the result briefly.

The problem of this special research was: What should the medical student be taught? What must the medical student know in order to qualify as a practitioner of medicine? I undertook to find out, first, what the medical student is being taught in our better medical schools today. This I attempted to do, first, by visiting various laboratory and clinical departments and inspecting the work done in these departments; and, secondly, by reading and reviewing (I found this both interesting and instructive) some recent generally employed textbooks on each subject, such as Macleod's "Biochemistry and Physiology" applied to medicine, Cunningham's "Anatomy," Starling's "Physiology," Jordan's and Zinsser's books on bacteriology, MacCallum's "Pathology," Kaufman's "Special Pathology," Cushny's "Pharmacology," Osler's "Medicine," Williams' "Obstetrics," Rosenau's "Hygiene and Public Health," and Lexer's "General Surgery" and the "Handbuch der practischen Chirurgie."

I interviewed the heads of the various departments and asked them what they thought (*a*) of the present curriculum of their own departments, and (*b*) of the curriculum as a whole, and obtained from them their views as to changes which they deemed advisable.

The questions were asked and answered with the understanding that there were two fixed conditions: first, that the purpose of the medical course was to train practitioners of medicine, and, second, that the present seven years of technical training (two premedical and four in the medical school, and the hospital intern year) were not to be increased. I attempted to obtain from the chief of each laboratory department his views, since it was impossible to cover completely his science in the course given to a medical student as to:

(*a*) What portion of his subject should be taught.

(*b*) In what part of the curriculum his subject should be presented.

(*c*) What prerequisite should be required, and his opinion of the instruction given to the medical students before they came to his department.

(*d*) What, if any, subjects in the first and second years in the medical school could be pushed back into the premedical years.

(*e*) The advisability of introducing the patient, "clinical problems," into the freshman and sophomore years of medicine, and, if in his opinion this should be done, his views as to how it should be done, whether by the clinical departments, the laboratory departments, or by both.

(*f*) If the laboratory subjects should be continued in some way throughout the third and fourth years, and if so in what way.

(*g*) The advisability of better cooperation between the various departments: (1) between the laboratory departments; (2) between the clinical departments, and (3) between the laboratory groups and the clinical groups.

I interviewed the heads of the clinical departments in much the same way: First, What portion of his subject should be taught, and how? I especially emphasized the questions:

(*a*) What portions of the laboratory subjects, anatomy, physiology, pathology and pharmacology, do you think the medical students should be taught?

(*b*) What is your opinion of the way these subjects are being taught at present, etc.?

(*c*) Do you think it advisable to introduce the medical student to the clinic in his first and second years, and if so, how should this be done?

(*d*) In the third and fourth years, largely clinical work, should the laboratory sciences of anatomy, physiology, pathology and pharmacology be continued in some way in the medical course, and, if so, in what way?

(*e*) What suggestions have you as to better coordination and team work between departments?

(*f*) In what way should the clinical departments be organized in the undergraduate medical course? Under three heads, medicine, surgery and obstetrics, with the specialty subtopics under these main departments, such a scheme in detail would be:

General medicine	Neurology Pediatrics Dermatology Hygiene and Public Health
General surgery	Orthopedic Oral Rectal Genito-urinary Ear, nose and throat Eye
Obstetrics	Including gynecology

or should each of these specialties be a separate department?

FIELD COVERED IN ACTUAL PRACTICE

In order to obtain a knowledge of what portions of the sciences of anatomy, physiology, pathology and bacteriology, pharmacology, medicine, surgery and obstetrics are actually used in the practice of medicine, I made a study of the work done in a well equipped hospital of

* Read at the Congress on Medical Education, Licensure, Public Health and Hospitals, Chicago, March 5, 1923.

* Owing to lack of space, this article is abbreviated in THE JOURNAL by the omission of several case reports. The complete article will appear in the author's reprints.

more than 400 beds. This is a teaching hospital in which a fair amount of research is being done, but in which the primary object (with which nothing is allowed to interfere) is to give to the patient the best care and the benefits of modern science. In analyzing the work done in this hospital, I asked myself the question, "What portions of these daughter sciences of medicine do I employ in my own work?" and I answered it by studying some of the cases which were under my care.

CASE 1.—In an old depressed fracture of the skull with epilepsy and paralysis of some of the muscles of the right forearm and hand, with resulting deformity and complete loss of function of the hand in which we did an arthrodesis of the wrist joint and transplanted the flexor carpi ulnaris into the extensor tendons, the special studies involved were anatomy and physiology: the anatomy and function of the motor area of the brain, especially the arm center and the anatomy of the wrist joint and the muscles and nerves of the forearm.

CASE 2.—In a case of resection of the stomach for carcinoma by the Billroth II method, the sciences employed were: (*a*) physiology, in the chemical analysis of the gastric contents and the examination of blood, blood pressure and urine; (*b*) physics, in the use of the roentgen ray, demonstrating the filling defect in the stomach; (*c*) pharmacology, in the use of morphin for pain; nitrous oxid and ether for anesthesia, and alcohol and mercuric chlorid to prepare field of operation; (*d*) anatomy, in making the abdominal incision and in the technic of the stomach resection; (*e*) pathology, in the recognition of the mass as a carcinoma from the gross appearance of the primary lesion, character of the involvement of the lymphatic glands, and the microscopic study of the specimen.

CASE 3.—A young man had a carbuncle on the back of his neck, and secondary hematogenous infection of the soft tissues of his foot and thigh. Here were involved: (*a*) pathology and bacteriology; the organisms in the carbuncle and in the foot were *Staphylococcus aureus*, and examination of the blood for bacteria was negative; (*b*) physiology; he did not have diabetes, but increased sugar content in the blood—170; (*c*) anatomy, in the technic of the operation.

CASE 4.—In a case in which there was a tumor of the spinal cord with pressure on the cord and resulting paralysis, the tumor was removed, followed by relief and recurrence. The tumor was malignant. Here the sciences of anatomy, physiology and pathology were especially employed.

CASE 5.—A boy, aged 4, had exstrophy of the bladder. Sonenburg's operation of removing the bladder mucosa, and transplanting the ureters to the dorsum of the penis was performed, and the raw surface was closed with skin and superficial fascia flaps. Here a knowledge of embryology was important and interesting.

CASE 7.—A girl of 18, with marked exophthalmic goiter, presented a typical picture. The basal metabolism was + 75. She had unfortunately been given for a short time iodin treatment. Ligation of both superior thyroid arteries, and six weeks later removal of four-fifths of the thyroid gland were performed. Here, were involved physiology in the basal metabolism test; pharmacology in regard to the iodin treatment; pathology of the specimen removed, and anatomy in the technic of ligating the superior thyroid arteries and removal of the thyroid.

CASE 8.—In a case in which the patient had a huge carbuncle of the back of the neck, and diabetes, urine examination showed a large amount of sugar, etc.; blood examination was negative for bacteria; pus showed *Staphylococcus aureus*. The patient was given insulin, improved, and became sugar free, but died in a few days. Postmortem examination showed multiple abscesses in the lungs, kidneys, etc. This case illustrated the importance of applied physiology, bacteriology, pathology and pharmacology.

CASE 9.—A man, aged 40, admitted on the medical side, had abdominal actinomycosis, which was mistaken first for kidney lesion and infected hypernephroma. Examination was performed by the cystoscopist in the surgical department. There was a mass in the right lower quadrant of the abdomen extending into the flank and kidney region. A perinephritic abscess was opened and drained under ether; a large amount of pus and degenerated granulation tissue was removed. The clinical diagnosis at the time of operation was "actinomycosis," on account of the clinical picture and especially the wooden infiltration of the abdominal wall. The laboratory report on the tissue was probable hypernephroma. Roentgen-ray treatment was given some weeks later. The surgeon again reviewed the case and again made a clinical diagnosis of actinomycosis, curetted the sinus, examined the granulation tissue removed, and found *Actinomyces*. The patient was put on mixed treatment of copper and potassium iodid, with copper sulphate irrigation and roentgen ray, with marked improvement. This illustrates: applied anatomy in the technic of the operation; applied pathology in examining the tissue; applied bacteriology in finding *Actinomyces;* applied pharmacology in using copper and potassium iodid; applied physics in the roentgen-ray treatment.

CASE 10.—A man, aged 60, with cirrhosis of the liver and an enlarged spleen, had had syphilis and was addicted to the use of alcohol; since prohibition he had been drinking extract of ginger with 82 per cent. alcoholic content. This illustrates: applied bacteriology in the Wassermann reaction; applied anatomy in the physical examination of the patient; applied physiology in examination of the blood, blood pressure, urine, etc., and applied pharmacology in treatment with mercury and iodid.

CASE 11.—There were three cases of ascites in my service at the time I made these studies:

A girl, aged 14, underwent exploratory laparotomy under local anesthesia, which showed malignant papilloma of the ovary, with extensive peritoneal implantations.

A woman, aged 40, presented a mass in the region of the gallbladder. The leukocyte count was 25,000; hemoglobin, 50 per cent. There was great loss of strength and weight; there were great pain in the back, and fluid in the abdomen. My clinical diagnosis was carcinoma. The attending physician and the husband were very urgent for an operation. Operation under gas-oxygen disclosed the peritoneum filled with milky peritoneal fluid chylous ascites, and an inoperable carcinoma of the liver, bile tracts and probably the pancreas and thoracic duct.

A woman, aged 50, ill many months, seen by many physicians, had suffered great loss of weight and strength; she was in pain; the temperature ranged from 100 to 102.5 F.; the leukocyte count from 55,000 to 60,000; the hemoglobin was 42 per cent.; there was fluid in the abdominal cavity. Clinical methods were exhausted without arriving at a diagnosis. Exploratory laparatomy revealed several pints of clear, yellowish peritoneal fluid. The abdominal viscera were carefully examined with the entire hand within the cavity. At first nothing was found; after long search a carcinoma of the left lobe of the liver was found.

All these cases of ascites illustrate the application of laboratory branches to clinical work.

CASE 12.—A man, aged 25, presented a clinical picture of renal colic on the right side. The urine showed red blood cells and pus. Roentgen-ray examination showed multiple kidney stone. A pyelogram showed dilated pelvis and calices. Catheterization of the ureters showed two functioning kidneys. The right kidney showed blood and pus in the urine; the urine from the left kidney was normal. There were no tubercle bacilli in either kidney. The phenolsulphonephthalein test disclosed the right kidney one-third normal, the left kidney normal. Blood chemistry was normal. The diagnosis was: stones in a greatly damaged right kidney; normal left kidney. Surgical therapy consisted of removing the right kidney under ether. The proper handling of this case shows the application of anatomy, physiology, pathology, pharmacology and physics.

CASE 25.—A man, aged 68, was ill six or eight months; there was blood from the rectum, and blood from the bladder. Later there was great bladder irritation. There was a sharp rise of temperature, and evidences appeared of ascending pyelitis, and then fecal matter from the bladder and urine

from the rectum. Proctoscopic and cystoscopic examination disclosed a mass between the bladder and the rectum just above the prostate. Fecal matter was seen pouring into the bladder. There was no opening from the bladder into the rectum on proctoscopic examination. The bladder was filled with sodium bromid and a roentgenogram was taken to determine what part of the intestinal tract communicated with the bladder. A colostomy was done under local anesthesia to exclude feces from the urinary tract and save the patient from immediate danger of death from hydronephrosis. The distal end of the bowel was completely separated from the proximal by dissecting off and invaginating the mucosa into the distal loop.

There were two cases that were interesting from the standpoint that an immediate diagnosis was made from the clinical picture and the physical examination without any laboratory findings, and immediate operation done:

One of my medical students was taken with a sudden pain while in the classroom. The instructor giving the course brought him at once into the Presbyterian Hospital, which building is connected with the college building. The student, aged about 25, was evidently suffering intense pain in the abdomen, especially in the upper portion, and the abdominal muscles were intensely rigid: what might be described as a boardlike rigidity. He had been treated for duodenal ulcer several years ago, before he entered the army; these symptoms had disappeared during his army life. We made the clinical diagnosis of perforating duodenal ulcer, sent him at once to the operating room, and found a very small perforation in the anterior wall of the duodenum, which was closed with two purse-string sutures.

A man, aged 60, was taken with a violent pain in the right lower quadrant of the abdomen. I saw him at his own home. The attending physician had made the diagnosis of an acute appendicitis with probable gangrene and perforation. The man was very ill, with a very rigid abdomen, especially in the right lower quadrant, and definite tenderness over the ordinary position of the appendix. Nothing was done in the way of laboratory tests except examination of the urine, which was negative, and a leukocyte count, which was 19,000; the temperature was 101 and the pulse rate 108. He was sent at once to the hospital by ambulance. Operation showed a ruptured gangrenous appendix, and the appendix was surrounded with two or three drams of very foul-smelling pus.

I cite these two cases particularly to show the great importance of the gross clinical picture and the necessity often of such immediate action based on these clinical findings as to exclude an exhaustive study of laboratory means of diagnosis.

These cases were in the service of a hospital surgeon. We want to remember, however, that without exception they were first in the hands of general practitioners, and they represent, therefore, some of the problems which confront the practitioner of medicine.

If we analyze in this hospital the general clinical work, the history taking, the physical examinations, the clinical laboratory work, the roentgen-ray laboratory work and the special work in basal metabolism in blood chemistry, in special bacteriologic examinations, Wassermann examinations, etc., in infant feeding, etc., and the technic employed in the sciences of diagnosis and therapeutics, and if we analyze each department as I have analyzed my own department, we can form an accurate estimate of what portions of the various sciences that go to make up the science and art of medicine are used in actual practice.

OPINIONS OF MEN IN GENERAL PRACTICE

In order to obtain a conception of the work which the general practitioner does in private practice, I obtained the evidence from several well-trained men, practicing in communities of from three to five thousand inhabitants, and also from men doing general practice in Chicago. I asked them what classes of cases they were taking care of without the assistance of consultants and specialists, what proportion of their cases were sent to a specialist, what laboratory work they were doing themselves, and what arrangements they made for laboratory work in general. These general practitioners are doing all sorts of medical work: obstetrics; infantile disease; general medicine, such as pneumonia, typhoid fever (fortunately now rare), kidney and gallstone colic, nephritis, and various lesions of the gastro-intestinal tract; injuries in general; fractures; dislocations; hernias; the ordinary ear, nose and throat work, including by some of them the removal of tonsils; the ordinary skin diseases; neurologic cases that develop in their work; insurance examinations; testifying in medical legal cases, such as personal damage cases; testifying in regard to the insanity of individuals; general preventive medicine involved in handling infectious diseases in a community, such as diphtheria, measles and scarlet fever; venereal diseases; heart lesions, and the ordinary minor eye conditions, such as foreign bodies, conjunctivitis and iritis. In their practice they themselves use the simple laboratory methods, such as urine examinations, blood examinations, especially hemoglobin, the leukocyte count and the differential white cell count, and examinations of sputum, feces and stomach contents. They make the blood pressure examinations. A considerable proportion of them do their own roentgen-ray work. There are certain laboratory tests which, as a rule, they do not do. They send their Wassermann examinations, Widal tests and pathologic specimens from operative work to some commercial laboratory. They send their specimens from the infected throats in suspected diphtheria cases to the state laboratory for examination and report. Most of them do minor surgery and many of them do emergency surgery, such as operations for acute appendicitis and strangulated hernia.

The consensus among these men seemed to be that they took care of about 97 per cent. of the patients who came to them, in the sense that they took complete charge of the case, and they referred about 3 per cent. of their cases to specialists. My conception before I investigated this matter thoroughly was that the general practitioner probably referred from 10 to 15 per cent. of his cases to specialists. After discussing the matter with well informed general practitioners, as I have done, I am convinced that in a large general practice, the practitioner sees so many slight ailments that the percentage of cases which requires the services of a specialist is probably well under 5. The well qualified general practitioner can take good care of 95 per cent. of the patients in his community.

I have gained from this investigation a wholesome respect for the practitioner in general practice who prepares himself so that he can take care of all classes of medical cases. His task is a much more difficult one than the task of mastering a narrow specialty, and he has a much broader conception of disease, a conception which enables him to be often of more service than a specialist.

The patient, as a rule, does not know just what is the matter with him. He does not know what specialist to consult, and the normal plan of handling the sick people in a community is for the patient to go to a competent general practitioner. From the evidence of my

investigation in from 95 to 97 per cent. of the cases, the well trained general practitioner is the best man to handle his case, and in the other 3 or 5 per cent. the general practitioner is better qualified than any one else to determine in a general way what the condition is and to select the specialist required for the particular lesion from which the patient suffers. The specific purpose of the undergraduate medical course is to train these general practitioners properly. The general practitioner must have on his desk, and within ready reach at all times, and must use them in his everyday work, his textbooks on anatomy, physiology, pharmacology and pathology, his textbooks on medicine, obstetrics and surgery, and some small textbooks especially written for the general practitioners on specialties of the eye, ear, nose and throat, and dermatology; also a good book on hygiene and public health. The general practitioner who will study his cases with the aid of such textbooks will be doing the best possible kind of postgraduate work. Nothing that the American Medical Association could do in the way of postgraduate medical education would be so important as a propaganda urging all members of the Association to do just that sort of postgraduate work in their own practice, the work that can be done by their own brains, with their own books and on their own patients.

OPINIONS OF STUDENTS

After obtaining this evidence from the medical teachers, I sought the opinions of the medical students, and was fortunate in obtaining the opinion of 600 medical students who were completing their clinical work. I present a composite of their views:

1. The work of the first two years is too theoretical; much of it is intended primarily for research. There is too much note-book work and too little reference to clinical application.
2. Anatomy receives much criticism. There is too little lecture work and demonstration, too little individual teaching, too much instruction by student assistants and very little clinical application.
3. The work in biochemistry is considered too theoretical. It requires time far out of proportion to its importance. It could be made to include subjects given in laboratory diagnosis. There is much criticism of this department.
4. Pharmacology is unsatisfactory in that its practical application is not made clear to the student.
5. Physiology does not have enough practical application pointed out and emphasized. There is too much frog work, too little human physiology.
6. Pathology, on the whole, receives more favorable criticism than any other department in the first two years. Pathology and bacteriology are taught from the point of view of their application to medicine, and the students recognize this fact.

The work of the third and fourth years received the following criticisms:

1. In therapeutics, better courses in prescription writing should be given. More discussion on therapeutics should be given in the clinics. The definite line of treatment should be given as each case is presented, and more definite instruction on such therapeutic agents as the roentgen ray and radium. The clinical value of such tests as basal metabolism and electrocardiograph should be made clearer.
2. In medicine, better courses in laboratory diagnosis are urged. The value of the small teaching clinic is recognized. Better instruction in physical diagnosis is needed. More systematic instruction should be given in the large teaching clinics.
3. In surgery, the courses on surgical pathology and the principles of surgery are favorably criticized, on the whole. It is urged that these subjects be taught with ample pathologic material, both gross and microscopic, and that the clinical application be shown by the introduction of patients illustrating the various conditions discussed. The value of the large teaching clinic is recognized, and the criticism made of operating in these large teaching clinics. They feel that little operating should be done in these clinics. The great value of dispensary work and of the small section hospital clinic and the ward walks is recognized. The courses on dog surgery and of surgical anatomy and operative surgery on the cadaver are favorably criticized.
4. In obstetrics, the chief criticism is that the student sees too little pathologic obstetrics. The outside obstetric cases attended by the student under intern and obstetric assistant instruction are appreciated by the student and criticized favorably.
5. The instruction in the specialties, eye, ear, nose and throat, and dermatology, pediatrics and neurology, receives fairly general favorable cliticism.

I have also obtained from a number of interns and senior students their opinions of the fifth hospital or intern year. They all regard it as absolutely essential, and more than 90 per cent. prefer a mixed to a single service.

As I have carried on this investigation, I have been much impressed by the excellent work that is being done in our American medical school. There is, however, a general feeling that the medical curriculum should be revised in order to secure better cooperation, better team work; and there is a very general willingness to bring this about.

A SPECIFIC PLAN

What we lack is a specific plan. On the basis of this study I venture to submit the following specific plan:

1. There are certain portions of the subjects of anatomy, physiology, pathology and pharmacology which are essential in actual practice and which are used every day in clinical work and which must be mastered.
2. The sum total of this knowledge now actually required is enormous, and is sufficient to crowd the time that can be allotted to the medical curriculum.
3. The essential portions of the daughter sciences should be taught so as to make clear their application to clinical work. This necessitates a radical change in the curriculum, the introduction of the patient and the clinic at the very beginning of the medical course.

It is the function of the departments of anatomy, physiology, surgery, medicine, etc., to make physicians: not to make anatomists and physiologists, orthopedic surgeons and neurologists. The making of anatomists, physiologists, orthopedic surgeons and neurologists is, to be sure, a part of the work of a medical school, but it belongs to graduate work. Such preparation is individual and special, and the undergraduate medical curriculum must not be burdened with it or handicapped by it. This means that the time has come when we must make a sharp line of division between undergraduate and graduate medicine. In revising the undergraduate curriculum, we must drop those portions of the sciences that have no clinical application in the hands of the general practitioner. As an illustration, a large part of the formidable subjects of biochemistry and intricate neurology should be eliminated. These subjects should be taught, but in a simpler, clearer way.

There should be introduced into the first year a joint laboratory and clinical conference. This conference should be given once or twice a week, and at this conference should be demonstrated clinical cases and pathologic material representing big general problems, such as diabetes, toxic goiter, jaundice, ascites, syphilis, tuberculosis and leukemia, and such subjects as wound repair, wound infections, aseptic technic, burns, frac-

ture, hemorrhage, shock, osteomyelitis, anesthesia, tumors and congenital malformations; and the use the clinician makes of anatomy, physiology, pathology and pharmacology in handling these problems should be demonstrated. At the same time, the laboratory teachers should have access to this clinical material so that they can demonstrate examinations of blood, urine, blood pressure, basal metabolism, etc., and the laboratory side of the same clinical problems. In this way, the student would learn how these sciences are applied in clinical work, and the laboratory men and clinicians could work together on the same problems.

In the work of the clinical years, provision for continuing the work of the laboratory years should be made. Each clinical department should see that this is done as thoroughly as possible. The department of medicine might make special effort to continue the work of physiology, pharmacology and pathology, and the department of surgery especially the work of anatomy and pathology. Each clinical department should have its own clinical laboratory and have full control of its clinical laboratory work. For purposes of convenience, it may be better organization to have a single roentgen-ray laboratory, a single laboratory for such work as blood chemistry and the Wassermann test, and a single laboratory for basal metabolism.

Pathology should be continued into the clinical years as a well organized department in charge of the postmortem work and general pathologic laboratories and museum, and the professor of pathology should act as a consultant to the clinical departments in important problems in pathology. There should be the best possible cooperation between the department of pathology and the clinical departments, and this depends largely on the personal equation of the men involved. If the department of pathology should seek to appropriate to itself all pathologic laboratory work, it would be fatal to the full development of the clinical departments, and it would be better to drop the department entirely out of the clinical years and appoint a hospital pathologist who would work under the joint direction of the clinical departments. This is true because the patient, his tissue and secretions and everything that goes with him must remain in the control of the clinician.

Whatever revision of the medical curriculum is made, there must be no conflict of authority and there must be good team work. The laboratory departments must remain supreme in their work, and the clinical departments must remain in absolute control of the hospital and the clinic. There is plenty of field for research for both groups and for all departments. Each department, both laboratory and clinical, must be actively engaged in research. The creation of a special research department in a medical school is a serious error which would sterilize the school and should not be considered.

In regard to the organization of the clinical work, the best plan for the undergraduate school is that of three departments:

Medicine, including subdepartments of pediatrics, neurology, dermatology, and hygiene and public health.
Surgery, including subdepartments of orthopedics, urology, oral surgery, eye, and ear, nose and throat.
Obstetrics, including gynecology.

Such a plan of organization is especially valuable in securing the well rounded curriculum that is so needed by the medical practitioner. The specialists and specialties find their special independent field and an ample field in the graduate school. What must the medical student know in order to qualify as a practitioner of medicine? That is our problem. If a number of our better schools made this the subject of a special investigation, we could then from such a joint study revise the curriculum on better and sounder lines.

MEDICAL EDUCATION, PAST AND PRESENT

J. A. WITHERSPOON, M.D.
NASHVILLE, TENN.

There has been a rapid transition in medical education during the last twenty years. During this period, the number of medical schools has been reduced one half. In 1904 there were enrolled in our medical schools 28,142 students, while in 1922 there were 16,140. The increased cost of medical education and the years, unproductive financially, to be spent in internships and assistants' positions will tend to restrict students to the wealthier classes. The constantly increasing number of specialists has caused a diminution in the ranks of those who practice among the great and vitally important group of citizens living in rural districts. Inevitably, these citizens will succeed in demanding, through the legislatures, that they have physicians that come from medical schools and that are well trained, or failing in this, they must accept those that come from some source with inferior equipment. While it would not be fair to say that the advance in medical education is alone responsible for the inadequate number of physicians in rural districts, the fact remains that demands for physicians are so insistent that already, in some states, legislators are seriously threatening a revision of our state laws and, unless something is done, our present standard will be seriously disturbed, if not abrogated altogether. Although the demand for physicians is constantly more insistent, high standards and increased costs are not entirely responsible for this condition. Richly endowed schools are limiting the number of students and turning away many thoroughly prepared men who have met every entrance requirement.

The medical profession has never failed to meet emergencies when they arise. Today, as has been shown, two glaring crises confront it. One is that we are not furnishing physicians who are willing to practice in the places where they are most needed; the other is that our system of education is training men in such a way that they could not practice efficiently in these places if they desired to do so. This is not only a menace to the people; it also threatens the system on which the blame falls.

HISTORICAL REVIEW

It is not pertinent to discuss medical education prior to the Civil War. In that period, medical schools were rare and the study of medicine under preceptors was the custom. In such a system, numerous defects are easily recognized.

Subsequent to the Civil War, medical schools began to multiply, and in less than half a century, there were more schools in the United States than in the rest of the world. This multiplication resulted from three factors: 1. The profession as a whole was poorly organized and had no data regarding the number and quality of its members, and no supervision over, or interest in, the numerous schools. 2. The states had not interested themselves in the enactment of laws

regulating the practice of medicine or of the schools that taught medicine. 3. The business of conducting a medical school proved so successful financially that the chairs had become valuable; reputations of professors were heralded abroad among the people by the students, and referred work came almost exclusively to those who taught. There were no preliminary requirements worthy of the name. One of the most emphatic lessons taught was that all surgical cases, and many of the others, should be referred to the professor. Consequently, there grew up, even in the smaller cities, two groups of physicians definitely separated and thoroughly despising each other: those that taught and those that did not teach. The teachers were successful, possibly some times boastful and supercilious. Those who did not teach could only look with jealous eyes on the "school men." There was no chance to get into the faculty of the school of that day. The only hope for ambitious outs was to organize a new school. This was promptly done: Tennessee had ten schools. The curriculums of the schools were poorly arranged, in most instances. In many, the subjects were poorly taught. The specialties were for the most part touched on very superficially.

Some schools, however, maintained standards in keeping with the demands of the times. Among those honestly trying to give the students a square deal were numerous schools in which the specialists laid the burden of stress on such phases of their work as the students who entered general practice would be called on to do. What was taught was intended to prepare the students to become general practitioners.

In spite of the flagrant faults and glaring inefficiencies of these schools of a former day, many of the leading men in the profession today graduated from them. Although their inadequacies must be decried, it would be well to look back and inquire whether or not they had aught of good.

STANDARDIZATION OF MEDICAL SCHOOLS

It was the consensus of opinion of the leaders in the profession, and the unanimous verdict of the legislatures of the states of this Union, that these old schools were not as good as they should be. Asepsis, bacteriology, abdominal surgery and the specialties were coming into prominence, and the profession and the public were being impressed with the idea that the future physician must be trained more widely and more thoroughly, and that expensive equipment and better trained teachers must be had. This impression gained its chief, if not its first, impetus toward realization in the work undertaken by the American Medical Association, in the investigation of conditions existing in medical schools, and, subsequently, in the standardization of these schools.

When the wisdom of the recommendations made by the American Medical Association was recognized, various state legislatures began to enact laws governing the practice of medicine. Those schools that realized the gravity of the situation began to consider how they could meet the new requirements. Numerous schools were discontinued, either by voluntary closure or because they could not enroll students to enable them to meet expenses, for students were not willing to receive degrees from a school whose graduates were barred from practice in a number of states. Other schools combined their resources to gain in strength of faculties and in numbers of students. Many prospective students were not eligible because of insufficient preliminary training, meager as the requirements were in the early days of this period. This tendency to increase the preliminary requirements has continued until now the Class A schools demand at least two years of college work, and a demand for a preliminary degree in academic work is probably not far in the future. The course of instruction was systematized; the term increased; the number of years of training leading to the degree of Doctor of Medicine was raised from two to four. An enormous amount of equipment had to be purchased; new buildings became necessary; all-time teachers were demanded for all laboratories; clinical facilities had to be obtained, either through securing control of hospitals already in existence, or through building, owning and operating hospitals. In other words, medical schools were rapidly converted from an asset to a liability, and the financial value of chairs dwindled to nothing—to less than nothing. The expense of operation of schools soon came to be far in excess of any revenue that might be gained from fees paid by students. The old dispensation had fulfilled its mission and passed away. The only hope for continuation of medical schools lay in endowment. This is one of the reasons why only those associated with, or which were an integral part of, great universities have been able to weather the storm and to maintain rank as first-class schools. It has been necessary to increase tuition charges, and still the call for more money rises as a perpetual cry from the boards of trust who must provide for meeting the ever-increasing expense.

All of this was brought about with splendid purposes in mind; but, in some way, the education of today seems to unfit men for the real practice of medicine at the bedside.

DEFECTS IN THE NEW SYSTEM OF TEACHING MEDICINE

That this revised, improved method of teaching medicine is not devoid of defects is apparent to all who have devoted much time to study of the problems involved. One objection is that it overworks the student and gives him an enormous amount of instruction which he cannot learn to use to advantage in so short a time—this in spite of, possibly also because of, greater clinical facilities. Another defect is that each teacher has felt and has tried to impress on his pupils the great importance of his own particular subject. Specialties, therefore, have been emphasized out of all proportion to their merit, and the student has been robbed of time and mental effort that could have been employed more profitably. It may be worth while at this juncture to call attention to the fact that the transactions of the last meeting of the Association of American Medical Colleges suggest reducing the amount of time devoted to the specialties to a minimum.

There has sometimes arisen a feeling among laboratory men that the clinical men were inferior in their training, and that teaching would be more competent if clinical professors would come into closer contact with laboratories. Recently, clinicians have reversed this sentiment, and they feel that laboratories would serve students and the public better if laboratory teachers knew something of patients and of disease as it actually exists in the living subject.

A FURTHER REVISION OF THE TEACHING SYSTEM

A plan of further revision of our teaching system has been recommended, whereby the teaching faculty shall be constituted of men who are to devote their whole time to medical teaching and to research work. This

plan, its authors believe, will prove ideal. It proposes virtually to establish a profession of medical pedagogy. This idea did not originate in the medical profession, but in the mind of a layman. The profession has not taken kindly to the idea. Yet, in all fairness, they should either accept it or show cause why it should be rejected. A layman might actually know more about this matter than a physician. On the face of it, that sounds unreasonable. Physicians have taught all the physicians the world has produced; practicing physicians have taught physicians to practice. If, as physicians, we do not believe that men who have never practiced medicine and who never intend to practice can teach the medical student as well as men who have practiced and are practicing can teach him, we should be able candidly to present good reasons for such belief.

THE PURPOSE AND FUNCTION OF A MEDICAL SCHOOL

Before presenting reasons for the conviction that is firmly entertained that the scheme providing for full-time teachers of medicine is impracticable, it is required that the purpose and function of the medical school be defined.

1. The only excuse for the existence of medical schools, hospitals or physicians is that there are the sick who wish to become well, and the well who wish to be protected against disease. The physician is the man who is employed and paid to accomplish the cure. The hospital offers him opportunity to perform his work skilfully and promptly.

2. The function of the medical school is to prepare physicians to cure the sick.

3. The volume of medical literature is so enormous that the student would be lost unless he had some one competent to guide him in its use. It has been the opinion, right or wrong, of the able and wise men in medicine that they could guide best who have been long, laboriously, earnestly and successfully engaged in the work of healing the sick. Thousands of theories, some of them wilder than the ravings of maniacs, have been fabricated. Who has proved them useless or wrong? The physician at the bedside.

4. The faculties of medical schools of the past have felt that there is an art in the practice of medicine, that circumstances arise in which tact and discretion different from and higher than that demanded in the ordinary walks of life—peculiar discretion and tact—are necessary, and that the student could acquire these best from men who had developed them to the highest degree; that successful clinicians could probably better transmit a modicum of their necessity and their significance than could some one groping from a musty library or a laboratory.

Thus, men go to medical schools to study, to learn lessons, clinical and didactic, to acquaint themselves as far as possible with the present state of advancement in medical knowledge, and with the methods of applying this knowledge in the practice of the healing art among the people. And the people are crying, whole communities, whole counties, for men to come to them with this skill.

5. Is not he who has responsibly healed the sick the best teacher to those on whom his mantle is to fall? Does he not have a sympathy that no other man could acquire? Does he not know from his experience with people and life and death a thousand things that were never written and that cannot be written? Has he not a sense of responsibility builded on his relationship with his patients, in homes as well as in hospitals? Other things being equal, which is the better teacher—one who has succeeded, or one who has not tried? Which the better teacher—one who has gone out and achieved success by hard work and the exercise of sound judgment and skilful practice, or one who has hesitated and trembled and finally has remained cloistered within the walls of the school or hospital because he fears to go? Does appointment to professional position make great clinicians and renowned surgeons? No evidence has been adduced thus far that it does.

6. It is the purpose—or should be—of the medical school to train general practitioners and to reduce the time devoted to special studies to a minimum so that the student may devote a maximum of time to the subjects embraced by the term "general practice." If any man would specialize, he should be required to spend sufficient time after graduation in acquiring proficiency in the chosen line of work. This cannot be done during his undergraduate years without neglect of the broad foundation in general medicine, without which no man can hope to become a truly great specialist.

To the average physician's mind, the word specialties suggests a group of lines of work in rather narrow fields of practice. Lately, a new and important specialty has arisen—medical research. Of them all, fewest men are capable of undertaking this. It is the most comprehensive, the deepest specialty, and it requires a much broader foundation than any of the others, as well as a sane head and a sound judgment. If the other specialties are to be omitted or given in limited degree to the undergraduate, because he has neither the time nor the foundation to grasp them, what shall be done about training him for research? He knows nothing; yet he is expected to discover something new.

OBJECTIONS TO THE EMPLOYMENT OF FULL-TIME TEACHERS

The objections to the employment of full-time men in medical schools to teach the practical branches are so numerous that it is difficult to reckon them.

1. First class, able men cannot be secured, at present, to occupy the chairs in any reasonably large number of schools on the salaries which the universities can pay them.

2. Certain intellectual traits are seldom associated in the same individual. Great teachers are rare; great research workers are still more rare. By the laws of chance, the two would almost never be found in the same individual. They are psychologic incompatibilities. To be a research worker worthy of the name is to be an inventor. It requires the ability to seize on an idea or suspicion and never to release it, never to dismiss it from the mind, until the last detail is finished, in a year or two, or in ten, or until it has proved a definitely unfruitful lead. That is real research work, and should be encouraged and fostered whenever a man with that kind of bent can be found. But such a man should not be put in the classroom. If he *can* teach, it would distract his mind from his research, and such men are geniuses and should be given rein and left to their own inclinations. If the real research worker should undertake to teach, he would either overload the student with the details and the spirit of his research, or, by lack of devotion of sufficient time to other subjects of his department, would fail to keep abreast the times. The student would be overloaded with this specialty and would fail to obtain the amount of valuable instruction required to equip him for practice,

which has already been shown to be prejudicial to the welfare of the student and to the public he is to serve.

3. There is no place in the actual practice of medicine for sustained medical research. It is condemned by law, and, according to all moral standards, a reprehensible practice. No man employs a physician to advance science at his expense and risk. No man would knowingly tolerate it. If a student is taught to do research work on his patients in the university hospital and is complimented on something great or small in connection with it, he might become convinced that that was a proper or permissible course—convinced, in a word, that the patient is only a sort of advanced laboratory animal. Could he then reasonably be expected to disgorge his mind of all these impressions and become an honest servant of his patrons on graduation? Would he not feel justified in trying out his new ideas on them?

4. For the foundation for this objection to full-time clinical teaching, it is necessary to appeal to the experience of every practicing physician. Has he not acquired anything during his years of practice that he did not have at the beginning? Would he not have been worth more to his patients had he known what he has learned twenty or thirty years sooner? Could he not, by contact with medical students, be of service to them by giving them something of this practical side of the work? Has not the desire to build and maintain and increase his practice caused him to search for the valuable, practical things, as contrasted with the theoretical? Has not his feeling of responsibility been increased by the fact that embarrassment invariably follows failure to accomplish the cure of his patients? Have not need and pride and ambition and fear of just criticisms and competition been the great stimuli that have forced him up and onward? Would these factors have affected the same good results if he had not been personally responsible for his success or failure? Is any normal man immune to the influence of these elements of success?

Suppose that the full-time professors and research workers conduct a hospital in which they treat patients and do research work for the education of medical students and for the advancement of science, and suppose the same professors have never been in private practice; is it not reasonable to imagine that this great thing which has been handed down from practitioner to practitioner and on which the good faith and responsibility of our profession rests will be lost to the men who go out from such a school? But suppose this hospital and the associated school take private patients. If the physician who treats them receives pay for treating them, he is not a full-time man. If he receives no pay for treating them, he still fails to secure the personal relationship between himself and his patient which a private practitioner experiences. If, however, he treats them and the hospital receives pay for his services and he receives only his salary, this teacher not only renders himself unworthy to teach because he sells his services for less than it is worth (otherwise the hospital would not have him), but he also becomes a menace to the fundamental principles of American institutions. Such practice is definitely socialistic, and such derelict usage cannot fail to impress the students who work under this regimen long enough to receive a degree.

5. Not only this, but such a man can and will, in the name of science and humanity, undermine and destroy the practice of competent, honorable, ethical men practicing in the community of the university and in adjacent communities. This is not imagination: it is history. The profession has grown into a dignified body, and, as a consequence of the deliberation of the wise fathers, has established and lived by a code of ethics. It has at times dealt harshly with members guilty of even minor offenses. A prominent clause in this code forbids the physician to advertise; and another forbids him, in any open, secret or underhand way, to rob his neighbor of his practice. These are the two peaks in the principles of medical ethics that loom high.

6. There is a possibility of injustice to the profession in that full-time teachers, with exclusive hospital facilities, may give service free to those able to pay, thus creating mendicants and paupers, to the great detriment of the individual, and an injustice to physicians who must sustain offices and other legitimate expenses. The advertisement of the position in the great university and hospitals, intentional or not, gives a great advantage. In fact, these places will in time, when thoroughly understood, be filled by men belonging to the research type who have had little or no experience in the practice of medicine or surgery, who are interested in the refinements of modern research in its application to their branch of activity, which of necessity develops a scientific attitude toward the patient rather than a humanitarian attitude, and which every experienced practitioner feels toward the life and comfort of those entrusted to his care. However ethical and high grade he may be, he has a great advantage through the advertisement that his position gives him; and the hospital and university place him in a position in which he gives service for less than his skill warrants. Sooner or later he will realize the injustice he is a party to, and will feel that he occupies a rather unenviable position in the profession. He takes no pay, and what fees are paid go to the hospital or university he serves. This is unfair and will sooner or later bring about a feeling of resentment in those who are the sufferers from this system. It is apparent that the patient will not receive the benefit of the real art of medicine, which means so much in the management of the sick.

7. The live, active, intelligent clinician is the man above all who knows where the weak places in medicine are. He knows the real problems, and, if allowed to work jointly in the schools, can be of untold service in directing the attention of research workers to fruitful fields.

8. The objection raised against clinicians as teachers is more valid when applied to research work, for the latter is a more time-consuming occupation than the former, less diversified, and offering much greater temptation to bias.

This new idea of full-time teachers in the practical departments of medical schools did not originate in the profession. It is the child of the brain of a man who never studied medicine, never practiced medicine and who doubtless has no inclination to do so; the child of one who, therefore, cannot realize fully what it means to be a physician; what the difference between a physician and a banker or a teacher is; who does not know the feeling of responsibility that every good physician knows. Now, this fond father brings this strange child and leaves it on the doorstep of the profession with the assurance that it is a fine child, and with the insistence that the profession adopt the child and make it sole heir to the throne of the empire which their fathers and they themselves have builded.

ANALYSIS OF METHODS OF MODERN MEDICAL EDUCATION *

WILLIAM COGSWELL CLARKE, M.D.
NEW YORK

The dilemma which confronts us today in any consideration of medical education is two horned. On the one hand we have the vast and ever-increasing fund of information that must be given to the student, and on the other, the shortness of the allotted time in which to give it to him. Methods of teaching must be found that are best suited to the majority of students, and that will serve to prepare them for the practice of medicine or for a life of research. What should be taught must also be decided. The good and the bad in past and present medical education must be remembered in order to solve this problem. Present methods have failed to deal adequately with the difficulties of the situation, and, if they are persisted in, the purposes of the medical school will be increasingly defeated.

The day of the morphologic ultramechanical impress on medicine, inculcated by the continuous study of dead tissues, has passed. The life-giving conceptions which the study of physical chemistry has given to all chemistry must be developed in advancing medicine. Medicine must thus vitalize its anatomy, its physiology and its pathology.

The medical schools as never before must develop the scientific spirit in research and in their teaching. The scientific spirit is that which influences a man to seek evidence and to seek it whole heartedly and dispassionately, whether it proves him right or wrong. No effort in science is wasted except the insincere effort. No medical school can reach the heights in education and continue on such a plane without this development in its ideals.

IMPORTANCE OF "PREMEDICAL EDUCATION"

In this consideration of medical education, no analysis has been made of the most important and difficult problem of "premedical" [1] education partly because it is impossible to do it justice and treat it as a subheading of the topic under consideration. Ideally, the student should learn of the relationship of the fundamentals of knowledge at as early an age as possible. His understanding of the interrelations of philosophy, ethics, biology and physical chemistry should be so thoroughly cultivated as to become of the nature of an essence, not a veneer. And this knowledge of the sciences must rest on a foundation of history and of the classics. Such students would solve many of the problems of medical education and make a suitable complement for able instructors.

The reorganization of medical education may be considered under five main subjects: (1) teachers; (2) students; (3) the subject matter included in a medical course; (4) methods of teaching and of study, and (5) the chief aims in medical education and the present hindrances to their attainment.

TEACHERS

A teacher is one who interests students in learning so that they endeavor to acquire knowledge for its intrinsic value. The fundamental difficulty lies with the teachers themselves. Boas [2] says: Intelligence does not come from the acquisition of facts; intelligence is insensitive to a mere fact; it reacts only to ideas. . . . The issue is the education, not of the student, but of the teacher."

Good teachers must not only be intelligent: they must understand and sympathize with the student's outlook, be able to keep alive the student's interests. A good teacher feels that he learns from his own students through an intimate association with their ideas. It is only through a constant revaluation of his own methods in the light of student opinion and by comparison with his colleagues that he can hope to grow. Who, indeed, can teach ably year after year, isolated from all ideas and criticism except his own?

The effect on the students of the personality and attainments of able men is well recognized. Their undefinable influence may be profoundly felt throughout an entire school; it may be as inspiring and dynamic as that of a Pasteur. Until schools make every effort to select for teachers men of stimulative personality, most teaching institutions will continue to be crowded with "good hearted," acquiescent individuals.

Continuance of Poor Teachers.—Much blame must be laid at the door of those who appoint the inferior teachers. Possibly their appointment may be excused, but the policy common to so many medical schools, of allowing them to remain year after year, cannot be forgiven.

Student Advice.—One of the main reasons for the continuance of poor teachers and poor methods in the medical schools is that student opinion is looked down on. The bitterest criticism by students at once changes into the most helpful advice as soon as they realize that they are listened to without prejudice and with sympathy. In a successful business, because success is dependent on output, complaints and advice of consumers are never ignored. Dickenson Miller has pointed out that "each professor knows only his own classroom, and the dean knows all the professors but not all their classrooms, while the students alone have a survey over the entire curriculum and see all the classrooms."

"Student advice" does not in any way refer to the partisan, back-stairs gossip of student cliques, telling the teacher only what they think he wishes to hear. By student advice is meant the general student opinion of the methods of the individual teachers, who hold their interest, who aid them to think, and under whom they gain related knowledge.

When the private quiz system was in vogue, some quiz masters continued to teach year after year, for they were the ones from whom the students learned. The mediocre and poor teachers discontinued their quiz within a few years. With roll-calls and compulsory attendance at college quizzes, this effective and silent criticism has been lost, and the teacher who is not teaching has found a sinecure in those medical schools in which the student's spoken opinion is not regarded. In universities in which the courses are all electives, the useless teacher is automatically eliminated. The docent system in vogue in German universities recognizes the value of student opinion to such an extent that the man who desires to teach after he has qualified as a docent is simply given a room to teach in. If the students come to hear him and take his courses, he is considered a successful teacher, and it is from the successful docents that the professors are chosen.

* From the Department of Surgery, Columbia University College of Physicians and Surgeons.

1. "Premedical" courses are given in many colleges. They attempt through physics, chemistry and biology to remedy the dogma of authority of school and kindergarten. Until the teachings of primary schools develop the thinking powers, an introductory medical course should supplement earlier education by attempting to develop the students' minds in seeking the truth.

2. Boas, George: What Do Teachers Know?

THE STUDENTS

Professor N. B. Pillsbury has drawn our attention to the fact that "one of the chief functions of education is selection." Education does not make stupid people intelligent, it merely aids in selecting the intelligent and develops their potentialities.

Though the average ability of the students entering a medical school remains about the same year after year, there are striking mental and physical differences among these "selected" men. Their perceptive power varies greatly; some learn best by their eyes, a few by their ears. No two of them have the same affective response to any situation. This response differs greatly even in a single individual from day to day. A good teacher is aware of these potentialities in individual students. He makes use of as many "affects" as possible to teach, to stimulate and interest them. He finds those most nearly attuned to his own emotional response the ones most helped by his personality.

The student's early education—their surroundings, whether sons of doctor, lawyer, soldier or sailor, have all produced an effect. A way must be found to help those who have not had previous opportunities to acquire something of the outlook which comes from a scientific and an intelligently critical atmosphere. If the school hopes to raise its standard, some system of selecting those desirable must be employed other than using high school and college "marks." In fact, if possible, the aptness of students for medicine and their general honesty of purpose should be determined before they are accepted. Methods which inspect the students —those about to enter and those already enrolled—from every angle, mental, moral and physical, will help in selecting the best to practice medicine.

SUBJECTS TO BE TAUGHT

Too much is forced into the schedule today. That there should be an extensive reduction in the number of required hours will readily be granted; but the manner in which this should be done is still undecided. The long standing lack of sympathy between the pure scientist and the pure clinician, each seeking to overemphasize one side of medicine, is a difficult complication.

The brunt of this lack of sympathy has fallen on the student, and it is for him that the two must be brought together. Medicine must make all developments of pure science eventually of practical use. The pure scientists must be asked for the answers to the problems of life. Therefore, for a medical school to do the most for its students, these links in knowledge must be continually fitted into the chain of education. The students who wish to go into pure science are entitled to every opportunity in the medical school. At the same time, the community has every right to expect that medical schools shall always provide the best for those who are to become practitioners of medicine.

It is evident that subjects of great importance to modern medicine have as yet found no place in our curriculum. There is a continuous up and down in the estimated value of methods of diagnosis and of therapeutics. Scientific knowledge concerning the relation of mental to bodily disease, and the methods of understanding and dealing with the resulting complexities, have been ignored almost to exclusion in many departments. Psychology has too intimate a relation to the science of healing to permit a first class medical school to exclude it.

In many schools, biology has been approached purely structurally. The angle worm and the frog have been dissected. The ameba and the paramecium have been drawn. It has not effectively developed the basic conceptions of life and its interrelatedness. The tissues have been treated as if dead; or, if alive, separated from the dynoplasm [3] of the animal. Biology should tell of the interrelation of the living cell with its environment, of heredity and of the energetics of living tissues, and act as a direct introduction to bacteriology, to histology, to embryology, and particularly to medicine and surgery.

In any schedule flaws and omissions can be found. Yet "touching on" so many subjects has led to much of the superficial study of the present day. The thing to be learned is how to evaluate knowledge. Such evaluation can best be reached by concentration and by correlated study in all their ramifications of a few subjects which best lend themselves to provide a background of medical knowledge.

Elective courses through which the students may fit themselves more fully for one or another phase of medical work play at present practically no part in many curriculums, so that only through the required courses does either pure scientist or clinician meet the students.

METHODS OF TEACHING AND OF STUDY

The greatest faults are those of commission; too much is being taught, and the material taught is uncoordinated. The different methods by which students have been prepared to become fit to practice medicine may be condensed into four general groups:

Group 1, in which the student attends passively, is constantly guided, dependent on the experience of others; A, the lecture; B, assigned textbook study; C, laboratory demonstration and clinical presentation of cases.

Group 2, in which the student both listens and talks: the quiz, conference and discussion.

Group 3, in which the student observes, reports and discusses: experiments and cases in the dissecting room, laboratory and clinic.

Group 4, in which the student takes the entire responsibility: student experimentation and investigation, either in the laboratory or in the study of cases in hospital or dispensary.

GROUP 1.—In which the student attends passively, is constantly guided, dependent on the experience of others. A. *Lecture System.*—Under this method of teaching, the relation between student and teacher is at its thinnest. The teacher cannot really know what effect his words are having on the students individually. Some lecturers almost expect the students to take stenographic reports of their lectures, and many attempt to do so, swallowing undigested the material handed out to them. The mental strain of madly writing down what they hear hour after hour, and of attempting to think at the same time, is bitterly fatiguing. If the lecturer is good, there is a constant sense of disturbance due to the fact that there is no outlet for the stimulus he creates. To those who do not take notes, the lecture, as one professor of biology remarked, "is a method by which the student is enabled to lean back perfectly at leisure and observe the personal peculiarities of the lecturer. Moreover, it is a kind of a sedative, an opiate to all parties, by which in the presence of a thin substitute for education, they are able to forget the aching need of the reality." In lectures, as one college professor has put it, "the ears do most of the work, using only one of the senses. In order

3. Dynoplasm: a term to suggest the inseparability of the energy manifestations of the living tissues; the inseparability of physicochemical actions and of substance.—H. A. Murray.

to fix a subject in a student's mind, he must experience the things talked about."

Aside from these real faults of the method, it is the one almost invariably used by the poorest teachers. The students speak of most lecturers as purveying cut and dried or "canned" knowledge, in that they follow some favorite or personally written textbook. The lecturer often uses the same notes year after year, unaware of their weaknesses. This could not happen so often if the students could be persuaded to ask questions during the hour, or could remember what to ask about at the end, and if there were real opportunity to do so. But questions are rarely asked, and the lecturer rarely comprehends his audience; he unconsciously presents blocks of knowledge, the relationship of which is not evident to the student. Small gaps or defects in the presentation of a subject are stimulating to the student who attempts to fill them in by mental effort and thus is led to think and to reason. But if the breaks are too great or too numerous, no amount of mental effort will make the student able to keep up with the train of thought, and he will eventually cease to supply the gaps between the bits of new information and the familiar knowledge given.

A plea for the lecture system is that much time is saved for a busy man, who may talk to a large class; but this is a poor argument in the eyes of the students, unless the lecturer gives more than can be found in a textbook. The lecture, however, is a simple and valuable means of leading the student safely through a new and difficult process of thought. A good lecturer can do this better than any book, and at far less expenditure of time and waste of effort on the part of the student; but he must be an unusual teacher, one who can think more rapidly than his students, and who can feel intensely whether or not the latter are following his argument. He must state conflicting ideas without prejudice, and explain the process of reasoning by which he has arrived at his own opinions. The man who comes fresh from his personal activities, whether from the clinic or the laboratory, and talks vividly of his work, gives much more than mere facts, in that he instils enthusiasm. The value of such a man as a teacher and inspirer can scarcely be overestimated. His stimulation leaves the student in a sensitized frame of mind.

Good lectures, if few and scattered, are useful, but good lecturers are rare. Further, if many good lectures were used, their composite effect would still be fatiguing; collectively, they would defeat just what makes any single lecture a success.

The fact that there is frequently no textbook arrangement which fits the curriculum of a school makes it impossible to abolish the lecture system completely, without loss of its correlating tendency.

Whatever the value of a single lecture, a long series of scheduled lectures in a day is educationally unsound. The students say that by the third hour they have fallen into a sort of daze, and that by 5 o'clock they are mentally paralyzed, utterly unfitted for the evening's work.

B. *Textbooks.*—These are invaluable, if several opinions on subjects are made available and if the student is fully aware that usually each book represents merely the opinion of one man. Too often assigned reading is from those books alone which agree with a teacher's opinion. Students frequently complain in that if they do not recite according to the assigned text, their statements are held as wrong even though they follow other authority. The teacher who assigns so many pages per lesson and asks in recitation for an unassimilated return of the material, lays his qualifications as a teacher open to serious doubts. Unfortunately, such use of books tends to fix even more firmly in students' minds the fallacy that the printed word must be true.

Even books that record only those observations which the writer regards as facts must not be thought of as authoritative. If the student reads opposed statements, made in all honesty by two or more "authorities," the experience is convincing that all books must be handled with mental care and read without prejudice.

C. *Laboratory Demonstration and Clinical Presentation of Cases.*—These should be distinguished from laboratory and clinical work, in which the specimens, cases and experiments are handled directly by the students. A series of specimens or cases is lectured on and exhibited; the students are passive listeners, and even those in the front rows can see but little, rarely anything that they are not told to see. Here, again the students' powers of critical observation of the facts presented are but little developed.

The method may have some uses, however; for instance, in the presentation of some difficult experiment, the technic of which requires so much time or is so difficult that the student is incapable of doing it himself; or in the exhibition of some exceedingly rare and seldom seen clinical case, such as anthrax or leprosy. Quite aside from what the student may learn of the clinical case presented is the inspiration which he will often acquire from watching an instructor who is an adept in the art of extracting all the essential facts about a patient, while at the same time gaining his complete confidence.

GROUP 2, in which the student both listens and talks. —*The quiz conference and discussion.* These may be regrouped either under an autocratically dogmatic procedure or a Socratic procedure. The dogmatic method suits many teachers, since they can more readily follow one textbook, and pleases some students, who then receive blocks of knowledge as facts which can be readily pigeon-holed in mind and note book, to be turned in at examination time. With the Socratic method, the teacher is under more of a strain; he must be mentally alive, continually matching his wits against the students'. By their example, teachers in this way help the students to think and to weigh evidence, and thus to build up for themselves coordinated knowledge.

The dogmatic procedure does not train the student to think; it teaches him only to remember. The objections to it are practically the same as the objections to the didactic, dogmatic lecture already discussed.

The Socratic method, in which the teacher and the students, by questions and answers, proceed from one bit of knowledge to another, because there are definite connecting links, can be used only by teachers thoroughly familiar with their own and interrelated subjects. The students are continually oriented as they proceed. This method forces the teacher to be aware of the students' mental equipment and progress.

In the quiz and conference, the student need not sit passively awaiting his turn, and, having recited, sink into a safe and sleepy neutrality; he can take a large part in the constructive work—how great a part is dependent especially on the ability of the teacher, but also on the development of the student.

The essence of merit in the quiz conference method is that coordination of subjects can be assured. This coordination in knowledge tends to develop an aware-

ness of what is important or unimportant in each subject. Thus, the student's burden is trimmed with discrimination as he proceeds.

GROUP 3, in which the student observes, reports and discusses specimens, experiments and cases with which he has come into direct contact in the laboratory and clinic.—By this method, the students are forced not only to think, but also to see for themselves. That they are desperately in need of such development is evident each time we hear them say, "I do not know what I am expected to see," or, on the other hand, when they see or hear what they are told to, even if it is not present: they can always feel a spleen.

The good teacher who understands the possibilities in coordination of topics usually also appreciates the differences in students' powers of observation and mental development. Under the method of individual study, he has opportunity to lead each, step by step, to observe and to understand what he sees. If students are first shown complicated specimens or cases, they become confused and acquire less knowledge than when they begin with simpler ones. Their studies must always be related with one another and with bits of knowledge already possessed. The success of this method for many students is dependent on the ability of the teachers, since the present day premedical development has not been such as to make students able to stand on their own feet.

On the other hand, this method is intensely stimulating to those well equipped, able to observe and learn without constant help. It is also an important aid in the selection of the most desirable students. The students who memorize facts and do well through their accuracy in presenting them, who are able to graduate at the top of their class through marks thus received, do not always shine when acquiring knowledge by personal observation and when they are forced to think for themselves. This is no criticism of any student with a good memory: only of those whose memories alone commend them. Such students are not of the type who advance general knowledge or who make good physicians; they should be recognized and taught to think, not encouraged by good marks to a false sense of their superiority. Individual observation forces each man to use his own senses, not accepting the evidence of another; reporting such observations requires of him an accuracy that he is willing to defend; interpreting them requires of him judgment and use of bits of knowledge previously acquired; and discussing them gives him an opportunity to defend his position and become aware of the degree of validity of his judgments.

GROUP 4, in which the student takes the entire responsibility: student experimentation and investigation.—*Independent study*. This is comparable to the "honors" system prevalent in English universities, wherein the student is free to study in his own way and is himself the judge of the time when he feels fitted to present himself for his examinations. Aside from the general basic knowledge required to pursue the course he has chosen, he is free to follow up the subjects that interest him most; always with the help and guidance of a tutor, who, though he is usually an instructor or research worker in one branch of science, must have his knowledge so well correlated that he will be able to guide the student in all branches. Examinations under this system come, not as a lock to close forever any part of the student's mind deemed by the professor to be sufficiently crammed, but as a key to give the student a further understanding of the relationship between the masses of knowledge he has accumulated throughout the years.

This method of independent study may not be practical for the average medical student of today, but is it not worth while to give to the better men a special chance to develop, even if they are an extremely small minority? Since this method tends to develop the resourcefulness of the capable student, it at least can be combined in many ways with a didactic scheme. With sufficient free time granted in the schedule, a student may study and experiment for himself under the heads of any of the main laboratory courses. Paternalism does not tend toward individual development: there is failure to throw the student on his own resources in not forcing him to think. A method which permits students to work independently and does not so carefully guard them that errors may not occur in experiments and observations tends to force each student to formulate his own conclusions. Thus, in spite of much poor teaching, the intelligent students will educate themselves, learning to weigh evidence and, through experience, acquire judgment.

DEVELOPMENT OF THE STUDENT

What is it that a school through all these methods of teaching seeks to develop in the student? Whether he is to become a pure scientist or a practitioner, in order to accomplish most for himself and others, must he not, as a student, acquire a truly scientific habit of mind? He will then in practice make use of available knowledge without prejudice. From the aspect of pure science, the value of this attitude is generally acknowledged; but from the standpoint of the community, this attitude for the clinician is even more important. For is it not through the practitioner that practical application is made of the discoveries in science? In fact, is it not probable that much of the lack of sympathy between the laboratory worker and the clinician has been engendered by the failure of the clinician so often to make full application of science in his practice and by the failure of the laboratory worker to develop a truly scientific spirit in future practitioners while they are students?

INCULCATION OF SCHOLARSHIP

The inculcation of a high degree of scholarship and an insistent craving for knowledge as something ideal is also most desirable. If those who have been taught at the College of Physicians and Surgeons, New York, in the dissecting room at any period during the last thirty years, will analyze that experience, they will see that Dr. George S. Huntington's impress on them to do well with honesty of purpose was of much more value than the knowledge of anatomy they acquired.

ENCYCLOPEDIC TEACHING

Have not medical schools fallen into the error of feeling that they must pack into the students' minds great masses of facts, more or less useless, but which must be found in that encyclopedia of medical information, the completely educated student? Why attempt the impossible? Must he not "practice" medicine during the rest of his life before his education can be completed? If the teacher of long ago realized this when he adopted the word "practice," how can it be hoped that all knowledge of medicine can be imparted at the present time in four years?

Should not medical education rather aim to have students able to judge what is important and what is unimportant, or at least to give them an opportunity to

undergo experience and to practice their judgment? They are then better qualified to be on the lookout for evidence, and to evaluate it as they find it. No teacher can lay down rules for discovering the important or unimportant, while the general teachers of anatomy, of bacteriology, of chemistry, of histology and of pathology must treat all fields as of equal importance.

Until there is a close coordination of the needs of many specialists, unimportant details will still seem to the student to be of equal value with the most important.

RELATEDNESS

Should not medical education particularly aim to link for the future practitioner of medicine all specialties so that their relatedness may be ever before him? Students are lost in the maze of seemingly contradictory statements of specialists. What the gynecologist teaches seems to contradict the teachings of the urologist, and the obstetrician disagrees with both, simply because each does not know of the needs of the other. Cooperation and interdepartmental sympathy with the necessities of specialists would not only save time in the study of medicine, but would give the students this much needed interlinking of the parts to form an orderly whole.

Relatedness is essential for comparison, and it is on comparisons that knowledge is built. It is necessary that topics and subjects be overlapped. Therefore, no topic can ever be regarded as finished: the practice of medicine is continuous and so is its study.

NONMEDICAL HEADS OF DEPARTMENTS

For the sake of such relatedness, the heads of all departments must be intimately acquainted with the needs of medicine. Medical experience alone can give this acquaintance. In choosing heads of departments, the search again is for men preeminently interested in the education of the medical student, and it is the exception for a man without a medical degree to have had such experience that his perspective will enable him to see his own subject in a coordinated relation with medicine as a whole.

DEPARTMENTAL BARRIERS

Interdepartmental partitions which are the inheritance of tradition and custom are distinct barriers to coordination. The terms physiology, pathology, medicine and surgery suggest that they are subjects apart, while in reality physiology and pathology shade by insensible gradients into each other and again into medicine and surgery. All of these rigid departmental partitions are imaginary. The present custom of departmental education in medicine tends to separate teachers both by a physical living apart, and by mental discord, because of different tenets and purposes. When the old line subjects—anatomy, physiology and pathology—were taught by a single practitioner, the students did not suffer from such discord.

THE BLOCK SYSTEM

From time to time, courses have been altered by the introduction of the so-called block system, whereby subjects are attached and finished in rotation. This is bad for two reasons: 1. What is learned by study of only a few minutes a day, carried through the years, results in the acquirement of more actual knowledge than that acquired by a continuous application over a short period of time. 2. The block system is not adapted to the material which is taught. It treats knowledge as if it could be divided into bricks, each one to be finished and packed away, a box when filled with such bricks to constitute a medical education. Knowledge of a topic, on the contrary, is no such solid matter, but is interdependent and vanishes if not kept alive through its increment. This block method obviously defeats all aims at correlation and orientation of students.

Students who are "fed facts" because they are "not capable of discrimination," as undergraduates, are not trained to judge wisely and with discrimination when they enter on their independent medical lives. Physiology can never be acquired to the full by assigning 800 hours of a schedule in the first year "to get it out of the way," as one man put it. Rather to be fully assimilated must physiologic thought and physiologic investigations continue throughout the four years, interwoven with medicine and surgery. Must not the "fundamental scientific subjects" be carried into the later years? Thus the student will be able to pick with more readiness the essentials from the nonessentials in his pure science courses. To be able to do this to the full, no subject can be regarded as finished, as in the block system.

FALLACY OF THE MARKING SYSTEM

Is not our real aim for the student to have him continue as a student during his lifetime? Circumstances which militate against this development are therefore objectionable because students are led to feel that in acquiring an A or B, day by day, their paper record as it grows in the hands of the quiz master is tantamount to a personal acquisition of knowledge. Hence the development of memory rather than of thought gains for a man the reputation of a real student. Further, the marking system forces students, too intelligent not to see the fallacy of the procedure, into at least a pragmatic acceptance of it. Again and again the most serious and well meaning will cut the classes and clinics in which they might be gaining valuable interests in order to cram a superficial, temporary memorization of facts necessary to attain "a good mark" in an announced test. Nor are they to be blamed; if the others set a standard for memorization, they feel they must follow, to get the "good mark" which in so many cases is used as the basis for the judgment of a man's worth—as though it were anything but the poorest reflection of his true capabilities.

The passing mark of 75 per cent.—C, used in many colleges—is another vicious influence, especially when there are many marked tests throughout the year. It tends to make the student feel he need make but three quarters of effort, only clean three quarters of a table, or at amputation cut through but three quarters of the tissues, especially since such marks are obviously inadequate, representing in no way the instructor's thoughtful estimate of the student's work or ability. Similarly, the mark tends to stimulate some students to obtain surreptitiously from notes or neighbors facts for the written test or recitation. Would it not be of greater aid both to student and to teacher to use a shifting scale? Work would then be either "satisfactory" or "unsatisfactory," according to the teacher's estimate of the student's ability.

Like the marking system, the formal examination which calls for an assembly of concrete facts is particularly to be deplored. The student who has the greatest amount of mental surface tension, and who can balance the largest number of facts on the end of his pencil, is the victor in such a contest, regardless of his ability or inability to understand or make use of these facts.

COMPETITION AS A STIMULUS FOR STUDY

Nearly all teaching methods employ a goad of some form; and the one which tends to maintain the student's self respect is the best. It is foolish to blind one's eyes to the fact that, since the world was young, man has striven and succeeded in competition, and he has become weak and vegetative without such a stimulus. Where the annual practical examination in anatomy is in vogue, all students aspire to enter the group of those who make no mistakes. Such a distinction comes only to those who make no mistake in competition with themselves and anatomy. This method serves as a healthy goad to the acquirement of a knowledge of the subject. The exercise of this stimulus can be produced in all subjects, not alone in anatomy.

PRACTICE OF MEDICINE

Having considered teachers, students, methods of teaching and of study, it is necessary to formulate what medical education is expected to give. The epoch of a morphologic, ultramechanical aspect of the living animal as a conception and basis for study is apparently passing. The substratum may be regarded as structural, but the correlation of functional activities must be regarded as the essence of life in an individual. Further, the biologist is insistent that derangement of functions brings about related functional changes and, progressively, alteration of structure. The progressive summation of functions and equilibration of structure constitutes the living individual. Students, however, are still led to think in mechanical terms and fail to realize that individual patients are not at all "closed systems." They are aware of the patient's environment, but have not a full conception of the interrelatedness and intrarelatedness of all energy phases even to the nth dimension. To make plain this concept of dynoplasm, coordination must be sought; the interdependence of all "normal" and "pathologic" conditions must be stressed that no graduate of a medical school shall go out with his knowledge walled off by interdepartmental barriers.

In essence, all are seeking what M. Louis so forcefully expressed to his pupils nearly a hundred years ago:

> Such and such have been my observations. You can observe as well as I. If you will study the art of observation, and if you will come to it with an honest mind and be faithful in noting all which you discover, and not merely the things which are interesting at the moment, or those which support a favorite dogma. I state to you the laws of nature as they appear to me; if true, your observations will confirm them; if not true they will refute them; I shall be content if only the truth be ascertained.

Think how far the capable student could travel on the road to a good medical education in the allotted four years, if all the teachers of "departments" should together frame a carefully thought out course, topic by topic. Up to the present, the various departments in many schools, without a due recognition of one another's responsibilities in the teaching of medicine as a whole, have devised a system which fills the student's time completely. Is there any valid reason why this should continue? And yet it has continued and does continue, and every year the ruts are worn deeper and the vision of the future is more and more obscured by the piled up walls of habit.

Many things that have been said in the preceding pages are but platitudes and repetitions to those who are interested in medical education; but until in some way these foundation stones of education cease to be used as roofing and are put where they can be of real value—not in books or even in the minds of educators, but in the practice and curriculum of schools—clinical lecturers will continue to think they are showing a skin mole to a whole class, when it is so small they can hardly see it themselves. Instructors will continue to lay down the law of dogma, and wonder what is the trouble when interns fail to cope with emergencies not laid down in the books. And we shall continue to write articles on medical education.

CONCLUSIONS

Only the best instructors should be chosen, because on them depends the selection of students and to a large degree their development and education. The surest way to have many good instructors available is continuously to develop them from those possessing the greatest apparent potentialities.

Teachers who do not continuously prove of value should not be allowed to remain in a school.

The method maintained should aim for the selection and maintenance of good teachers and laboratory workers, for under them any method of education is successful.

437 West Fifty-Ninth Street.

DISPOSITION OF URETERS IN CERTAIN ABNORMAL CONDITIONS OF THE URINARY BLADDER*

WILLIAM E. LOWER, M.D.
CLEVELAND

In the majority of cases, the condition for the relief of which transplantation of the ureters is indicated is a congenital anomaly known as exstrophy of the bladder; this condition is not progressive, and regarding its causation no information which will affect the condition itself may be expected to be developed. It is estimated that exstrophy of the bladder occurs once in every 30,000 to 50,000 births. If this is a correct estimate, there must be about 2,000 cases of exstrophy in the United States. With one or two exceptions, no single surgeon has had more than a very limited series of cases, so that when the occasional case comes to him he has no basis of judgment as to the best mode of procedure. It follows that in many cases only a plastic operation is performed which closes the external defect but does not relieve the chief source of distress, and nothing remains for the unfortunate patient but the continual use of some device for holding the constantly dribbling urine. Even with the utmost efforts to maintain cleanliness, however, these patients can scarcely ever be free from the pervasive odor of urine, and they are practically forced into a life of self-abhorrent isolation. Moreover, none of these devices are effective at night. All of my own patients, at least, have stated that at night they were obliged to wrap themselves in rubber sheets. It is difficult to imagine a more uncomfortable existence. In addition, the appliance itself may prove an added menace for, as in one of my own cases, the constant irritation of the already excoriated surface produced an epithelioma.

It would appear fitting, therefore, to discuss the management of these cases with a view to standardizing a technic which will effectively and permanently remove

* Read before the Philadelphia Genito-Urinary Society, Jan. 29, 1923.

the most distressing symptom. Moreover, since this congenital condition has no relation to any method of prevention, the necessity of establishing a standardized operative technic becomes even more urgent.

Much has been written regarding the developmental factors which give rise to exstrophy, but that information does not aid us in correcting the deformity or relieving the chief cause of distress—the constant dribbling of urine. While other deformities are often associated with this anomaly, these patients, as a rule, are not mentally defective, and if given the opportunity would progress intellectually with other children of their own age; but, as they cannot be sent to school, they are deprived of the educational advantages that other children receive.

CHOICE OF SITE

The preliminary queries which must be answered in considering a standardized technic are these: 1. What is the safest and most efficient site to which to transplant the ureters? 2. At how early an age may correction of the condition be undertaken? In answering the first question, one must consider the utmost possible control of the urine and the minimum danger of ascending infection to the kidneys. It will be noted that, contrary to the judgment of most writers, I have placed the danger of ascending infection as second in importance; with the ureters in their exposed site in the exstrophied bladder, the danger of ascending infection could hardly be increased, whatever the site selected for their transplantation.

Moreover, there has been no case as yet of damaging infection in any of my own cases. Nor can I agree with Peterson that the prevention of ascending renal infection is dependent on the transplantation of the vesical flap with the ureteral orifices—that is, by Maydl's operation. The extensive experimental work of Baird, Scott and Spencer [1] also seems to justify our assumption that the danger of an ascending postoperative renal infection is in no wise an expected sequence of transplantation of the ureters. Of particular interest in this connection are experiments by Draper and Braasch [2] in which they produced an intensive infection in the bladder, but "were never able to show that there was any infection whatsoever of the kidneys in these animals, and many of them lived for a number of months. Moreover, hydronephrosis did not occur; the real factor in reflux prevention being the physiologic activity of the ureters, rather than the mechanical action of the valve." Since in transplantation to any site we have no reason to believe that the normal physiologic activity of the ureters themselves has been impaired, these findings would stand, whatever the site of their termination.

There are certain other conditions besides exstrophy of the bladder for which transplantation of the ureters to some site outside the bladder is indicated, such as other malformations, either congenital or acquired, in which the bladder no longer acts as a reservoir for the urine, or in which the presence of the urine causes intolerable irritation; and also injuries as the result of which the vesical sphincter has been permanently damaged so that it no longer functions and in which repeated attempts at plastic repair have failed. Neoplasms of the bladder involving the ureteral orifices may also require this operation. However, in such cases a simple form of transplantation in situ as previously described by me may be adopted.[3] In any of these conditions, the urgency of operative relief is sufficiently indicated by the intolerable incontinence which makes the patient a burden to himself and an offense to others.

The prime problem, as I have indicated above, is the choice of a site to which to transplant the ureters. In making this choice, various authors in the past have considered the openings of aberrant ureters or have made their choice in accordance with embryologic and evolutional considerations. As for the extravesical openings of aberrant ureters, little is to be gained by their consideration. The fact that aberrant ureters may open in the urethra, the vagina, the vestibule of the vagina, Gärtner's ducts, the uterus, the seminal vesicle, the vas deferens or ductus ejaculatorius, the rectum or the intestines, with the exception of the last two sites named, does not offer any suggestion of possible value. Embryologic and evolutional considerations, however, seem to be of more value.

As was noted by Simon,[4] who, as far as I know, was the first to consider a direct union between the rectum and the ureter, the fact that in the embryo the cloaca serves as a common reservoir for intestinal and urinary excretion, and that this is the case also with birds and with certain of the lower mammals, appears to indicate that the bladder was developed, as it were, as an after-thought, not from the point of view of safety, but for the greater efficiency of the highly developed organism. There is no fundamental reason why urine and feces should not be collected in a common reservoir. Moreover, as I shall show later, the normal mode of exit of the ureters can more readily be approximated in the intestines than in any other of the sites that have been proposed.

Nevertheless, a review of the literature shows that practically every possible site has been used for transplantation—the urethra, the vagina, the loin, the groin, as well as the colon and the rectum. Transplantation to the loin, in particular, has had its latest and most ardent advocate in Bottomley,[5] who believes that by this method danger of infection is minimized and that, with the wearing of a properly fitted urinal, the patient is relieved from undue discomfort to himself and annoyance to others. Watson [6] advocates a direct connection between the pelvis of the kidney and the skin of the loin by means of rubber tubing, in the belief that the danger of infection is thus minimized. By far the greater number of authors, however, have advocated some method of transplantation to the intestinal wall. As far as I have been able to discover, the first diversion of the stream of urine to the intestines was made by Lloyd [7] in 1851. By means of a skein of silk used as a seton, he endeavored to conduct the urine from the bladder to the rectum. Simon, who has usually been credited with the first ureteral transplantation, did not perform a true transplantation, but made a ureterorectal fistula.

1. Baird, J. S.; Scott, R. L., and Spencer, R. D.: Studies on the Transplantation of the Ureters into the Intestines, Surg., Gynec. & Obst. 24: 482-484 (April) 1917.
2. Draper and Braasch, in discussion on Furniss, H. D.: Postoperative Renal Infection, J. A. M. A. 61: 957-961 (Sept. 20) 1913.
3. Lower, W. E.: Disposition of the Ureter in Surgical Conditions of the Bladder, J. A. M. A. 75: 711-713 (Sept. 11) 1920.
4. Simon, J.: Ectopia Vesicae: Absence of the Anterior Walls of the Bladder and Pubic Abdominal Parietes; Operation for the Directing of the Orifices of the Ureters into the Rectum; Temporary Success; Subsequent Death; Autopsy, Lancet 2: 568-570, 1852.
5. Bottomley, J. T.: Operative Treatment of Exstrophy of the Bladder by Transplantation of the Ureters into the Loin, J. A. M. A. 49: 141-144 (July 13) 1907.
6. Watson, F. S., and Cunningham, J. H.: Genito-Urinary Diseases 1: 445, 1908.
7. Lloyd: Ectopia Vesicae (Absence of the Anterior Walls of the Bladder); Operation; Subsequent Death, Lancet 2: 370-372, 1851.

It is interesting to note that Roux,[8] in 1853, proposed "that the ureters be sunk in the rectum, and that the exstrophied bladder be covered by skin through plastic operations. . . . Roux was led to believe that these operations were anatomical possibilities from a study of cases where the ureters opened into the rectum, and from the numerous instances on record where, after the removal of the vesical stone and the establishment of vesicorectal fistulas, the patients were still able to control their liquid evacuations. He refrained from putting these ideas into practice because of his uncertainty as to the relations of the peritoneum and rectum in exstrophy of the bladder." [9]

As far as I have been able to discover, the first true transplantation was done by Smith,[10] in 1878, who performed a bilateral ureterocolonic anastomosis in two stages by the extraperitoneal route. From then until 1891, no cases seem to have been reported; but since Küster's report in that year, the literature has been fairly rich in reports of transplantations into the rectum or colon by various methods.

Extensive reports from the literature have been made by Peterson [9] and Buchanan,[11] while perhaps the largest single series is that reported by C. H. Mayo [12] in 1919. Peterson compiled thirty-three ureterointestinal implantations, among which sixteen were double implantations—six for cancer of the bladder; one for tuberculosis of the bladder; seven for exstrophy; and two for cancer of the uterus, extension from which had involved the ureteral orifices. In this total series of thirty-three operations, the primary mortality was 33 per cent. Later deaths from pyelonephritis are noted in six cases with two deaths from uremia. Peterson compiled also thirty-six cases of ureterotrigonal-intestinal anastomosis, among which thirty-two were for exstrophy, with an operative mortality of 14 per cent. Among these, two patients died of pyelonephritis, four and fifteen months after the operation. The not unduly forbidding percentage of deaths in the second series, and the rare occurrence of pyelonephritis make one wonder why the value of intestinal implantation was so greatly questioned. A mortality of 14 per cent. after operations for a condition which in itself limits the length of life, and in any case makes life a continual burden throughout its duration, does not seem to be one which should have warranted any question of the fundamental value of the procedure. As C. H. Mayo has stated, "statistics show that 50 per cent. of all persons thus afflicted are dead by their tenth year, and 66.67 per cent. are dead by their twentieth year." Buchanan compiled from the literature 131 cases of intestinal implantation of the intact ureters with part of the bladder wall, with an operative mortality of 25 per cent. Among the ninety-nine surviving patients, eleven were reported to have died subsequently of ascending renal infection. Although this is a comparatively high percentage—11.2 per cent.—nevertheless, as Buchanan himself states, there is no way of ascertaining whether or not the kidney infection may not have existed at the time of operation; nor was the condition of the transplanted ureters themselves known, a point which is considered important by many investigators. Buchanan does not give any statistics regarding continence, but Peterson states in connection with the second series of thirty-six cases that sphincteric control was mentioned in the reports of twenty-nine, the average frequency of evacuations being from two to four hours. In the Mayo Clinic series of twenty-six cases referred to above, twenty-two of the operations were reported as successful.

Researches by various investigators have shown that the transplantation of the ureters to the duodenum is accompanied by symptoms of uremia with a fatal termination. If one ureter is transplanted to the duodenum, the remaining kidney seems to be able to take care of the uremic toxins—death occurring promptly, however, when the second ureter is transplanted, or when the kidney in the nontransplanted side is removed. It appears to me that the result of transplantation to the duodenum can hardly be used as a basis of argument as to effects of transplantation to the rectum. It has been shown that absorption from the intestine decreases progressively within the large intestine, until within the lower colon and rectum it is practically nil. If absorption from the rectum were sufficient between evacuations to produce uremia, it would also be sufficient to produce a chronic toxemia from the products of intestinal digestion.

As a result of an experimental study in 1909 in which normal sterile urine was allowed to leak directly into the peritoneal cavity, Barney [13] concluded "that the abdomen may bear without damage, and even in some cases without severe reaction, the effusion of a certain amount of sterile urine, and that it is able to guard itself quite promptly and efficiently against this effusion by the formation of adhesions. . . . It is in those cases where this prompt occlusion does not occur, seen oftenest in dogs, or where the urine is septic from the start, that a general peritonitis sets in." He concluded that the cause of death in these animals was primary sepsis, even though uremia played its part. On the other hand, Cecil and Cummings,[14] in 1918, called attention to the possibility of deleterious remote effects of absorption of urine from the colon, drawing their conclusions from their observations in a case of traumatic unilateral uretero-intestinal anastomosis. It is to reduce to the minimum the danger of urinary absorption that I advocate the retention of a rectal tube immediately after operation until normal periods of evacuation are established. Later, when the longest periods of retention last over night—that is, not more than seven or eight hours—the danger of uremia from absorption would appear to be a remote possibility. Blood chemistry tests in a number of cases of my own have been made during the last few weeks, and in no instance has any abnormal urea content been noted.

Of special interest in this connection is Keen's [15] case, "in which for thirty-five years a woman defecated and urinated, and for eleven years menstruated, by the rectum." He reports that "no ascending renal, vesical or uterine infection occurred at any time, nor did the

8. Roux, Jules: Exstrophie de la vessie: autoplastie pour masquer la difformité et créer un reservoir capable de retenir l'urine pendant un certain temps; insuccès; establissement definitif d'un canal cutané propre à maintenir en place un reservoir en caoutchouc vulcanisé, Union méd. **7**: 114-115, 1853.

9. Peterson, Reuben: Anastomosis of the Ureters with the Intestine: A Historical and Experimental Research, J. A. M. A. **36**: 444-445 (Feb. 16); 506-507 (Feb. 23); 569-573 (March 2); 632-635 (March 9); 735-738 (March 16); 808-815 (March 23), 1901.

10. Smith, P.: An Account of an Unsuccessful Attempt to Treat Extroversion of the Bladder by a New Operation, St. Bartholomew's Hosp. Rep. **5**: 29-35, 1879.

11. Buchanan, J. J.: Remote Results of Implantation of the Ureters into the Bowel for Exstrophy, Surg., Gynec. & Obst. **8**: 146-155, 1909.

12. Mayo, C. H.: Exstrophy of the Bladder, Contributions to Medical and Biological Research, Dedicated to Sir William Osler **2**: 1095-1110, 1919.

13. Barney, J. D.: Intraperitoneal Division of One Ureter: A Clinical and Experimental Study, Tr. Am. Urol. A. **3**: 262-288, 1909.

14. Cecil, A. B., and Cummings, R. S.: The Remote Effects of Absorption of Urine from the Colon: A Case of Traumatic Unilateral Uretero-Intestinal Anastomosis, J. Urol. **2**: 469-479 (Dec.) 1918.

15. Keen, W. W.: A Case in Which for Thirty-Five Years a Woman Defecated and Urinated and for Eleven Years Menstruated by the Rectum, Surg., Gynec. & Obst. **69**: 606-608, 1919.

mucous membrane of the rectum at any time resent the constant presence of the urine or the periodical presence of the menstrual blood."

As for the danger of ascending infection, that this danger exists cannot be denied; but I do not believe that it is greater in the case of the transplanted ureter than in the case of the exposed ureter in the exstrophied bladder. I believe, moreover, that within the rectum with its natural defenses it must be less than when the ureters are transplanted to the skin, where they meet with no such natural defense.

Steinke,[16] Sweet and Stewart,[17] Wislocki and O'Conor,[18] Satani,[19] Sampson [20] and others have made extensive studies of the possibilities of reflux of urine from the bladder to the kidney, and have apparently established the fact that the direct waves of peristaltic activity are determined by the metabolic gradient—the metabolism being increased at a point of infection. It would follow that, if a point of infection is near the terminal of the ureter, a reflux peristaltic action might carry bladder or rectal bacteria to the kidneys; but this argument does not seem to me to be pertinent for the reason that I have stated above. Such a reverse peristalsis would also carry toxic substances from the exposed ureters in the exstrophied bladder.

AGE

The second of the queries noted in the beginning of this paper, regarding the age at which transplantation of the ureter should be undertaken, cannot be answered with certainty. My judgment is, however, that operation should be deferred until the child has reached the age when he can be trained to control the anal sphincter, and that the operation should be done as soon after that age is reached as possible in order that the control of the anal sphincter for urine as well as for feces may be acquired more easily and more completely, and that the child may mingle with his fellows and begin his schooling at the normal age.

It is not necessary to review these various methods, in particular that of Maydl, which was for many years the method of choice until Coffey's [21] investigations, whereby he developed a method of implantation closely analogous to the normal route of the ureters through the bladder wall. Coffey's method was the result of a research to determine a procedure whereby the portion of the pancreas remaining after its head had been removed might efficiently deliver pancreatic juice through a new opening in the intestine. This study became a study in hydrostatics, or, as Coffey himself calls it, *static intra-intestinal pressure*. The principle of the operation, as summarized by him, consists of "submucous implantation of the duct for the purpose of reversing the course of *static intra-intestinal pressure* and bringing it to bear on the site of the duct. . . . The essential mechanical principle necessary to uniformly successful implantation of the ureter is that *the ureter shall be made to run immediately under the loose mucous membrane for a distance, before entering the lumen of the intestine.*"

Stiles' application of Witzel's tubularizing principle and Martin's muscularizing method should also be noted as efficient modes of implantation. My own belief is that some technic which insures the application of the principle proposed by Coffey should be adopted. The following special points, however, may be mentioned here. Preliminary to operation, the function of the kidneys, as for any operation on the ureters or bladder, is checked up by blood chemistry and by the use of dyes. For two days before the operation the bowels are cleared out, a rectal douche being given on the day of the operation. Of particular importance is the placing of the patient in the Trendelenburg position, which brings the abdominal viscera well out of the pelvis, according to the method of Guthrie, who advocates that the patient be put in the Trendelenburg position before the anesthetic is given so that the suction of the diaphragm will help to pull the intestines out of the pelvis. All the abdominal viscera are held out of the pelvis by sufficient packing with gauze. Formerly, I clamped off the bowel as suggested by Coffey; but, if the bowels have been thoroughly cleaned out preoperatively, this is not necessary, and more recently I have not used the intestinal clamp.

The interval between the transplantations, of course, varies with the individual patient; but, in general, two weeks is required for the wound to heal solidly and in order to make sure that the kidney on the transplanted side is functioning. The extraperitoneal route, in my opinion, should be avoided. My own greater success has come from operation by the intraperitoneal route. There is a physiologic reason why the danger of infection is increased in extraperitoneal operations, for, as Crile has suggested, the extraperitoneal space is weak or lacking in defenses against infection. In these defenses, the intraperitoneal area is among the most richly supplied of any in the body. Operation by the intraperitoneal method should therefore minimize the danger of infection. Since I have adopted the present method of operation by the intraperitoneal route, I have had no case of infection.

As stated above, another important point, in my estimation, is the use of a rectal tube until the rectum shall become adjusted to the presence of urine, and the employment of saline rectal douches. Danger of urinary absorption is thus reduced to a minimum.

My own personal series of bilateral transplantation of the ureters into the large intestine includes sixteen cases: three for carcinoma of the bladder, and thirteen for exstrophy. In addition to these, I have made one transplantation into the loins.

The age of these patients has varied from 4 months to 54 years. The patients have been presented or have presented themselves for the outstanding disability noted above; namely, constant irritation of the parts, penetrating odor of urine and resultant isolation. Ten of these operations have been performed by the method described above, the operation being performed in two stages in five cases, and in three stages in four cases. In the tenth case the patient died after the first ureter had been transplanted. In this case, on account of a greatly dilated ureter, it was impossible to make a good transplantation, and leakage occurred.

I have never had any series of cases in which the patients themselves have reported so happily as is the case with these. From frail, unhappy, morbid individuals, these patients are transformed into happy, optimistic,

16. Steinke, C. R.: Transplantation of the Ureters into the Gastro-Intestinal Tract. Univ. Pennsylvania M. Bull. **22**: 110-121, 1910.
17. Sweet, J. E., and Stewart, L. F.: The Ascending Infection of the Kidneys, Surg., Gynec. & Obst. **18**: 460-469, 1914.
18. Wislocki, G. B., and O'Conor, V. J.: Experimental Observations upon the Ureters, with Special Reference to Peristalsis and Anti-Peristalsis, Bull. Johns Hopkins Hosp. **31**: 197-202 (June) 1920.
19. Satani, Y.: Experimental Studies on the Ureter, Am. J. Physiol. **49**: 474-495 (Aug.) 1919.
20. Sampson, J. A.: Ascending Renal Infection, with Special Reference to the Reflux of Urine from the Bladder into the Ureters as an Etiological Factor in Its Causation and Maintenance, Bull. Johns Hopkins Hosp. **19**: 334-352, 1903.
21. Coffey, R. C.: Transplantation of the Ureters into the Large Intestine in the Absence of a Functionating Urinary Bladder, Surg., Gynec. & Obst. **32**: 383-391 (May) 1921.

social beings, who are able to go about their business. It should be emphasized not only that the immediate recovery is of prime importance in such cases as these, but also that the economic saving is of inestimable value in the end-results.

One patient, a bank teller, is regularly at work; he has sphincteric control for from three to four hours during the day, and has complete control throughout the night. He has gained in weight, and states that he "feels fine and was never so comfortable or happy."

Another patient, one of the rare cases of epispadias in a woman, was a wan, unhappy, shrinking person when she first presented herself. Now, more than a year since her operation, she has sphincteric control for eight hours; scarcely ever gets up at night; has gained in weight, and is exuberantly happy.

Although the sphincteric control has varied, in no instance in this series has it failed completely, in nearly every case the control being possible for from three to four hours.

SUMMARY

Transplantation of the ureters is an operation urgently indicated in the presence of certain malformations of the bladder, either congenital or acquired. The choice of site should be one to which the transplantation can be made with the minimum of immediate operative mortality and a maximum of ultimate comfort to the patient. Based on my own personal series is my belief that the submucous implantation of the ureters in the sigmoid or rectum by the technic first proposed by Coffey most nearly fulfils the foregoing requirements. In any case, agreement regarding the most efficient method of treating the class of patients on whom this operation is required is needed in order that the technic may be standardized. The basis of judgment for the final selection of such a standardized technic should be its ability to give to the patient the utmost possible diminution of his misery and the best possible economic status.

ALOPECIA AND POLIOSIS OF THE EYELIDS

WILLIAM CAMPBELL POSEY, M.D.
PHILADELPHIA

A married woman, aged 37, a brunette, consulted me, Dec. 27, 1922, on account of a falling out of the eyelashes from the left upper lid. This process had not been accompanied by any inflammatory condition of the lid itself or by any loss of hair elsewhere on the body; its duration had been rather rapid, all the lashes disappearing in about four months, with the exception of those growing from the nasal quadrant, which remained several weeks longer than the rest. The patient's physician, Dr. Morris Flexner of Louisville, Ky., attributed the condition to a general asthenia following a miscarriage, three or four months preceding the loss of lashes. An examination of the blood made at the time showed hemoglobin, 85 per cent.; red blood cells, 4,040,000; leukocytes, 11,200; polymorphonuclear neutrophils, 87 per cent.; eosinophils, 3 per cent., and lymphocytes, 10 per cent. Urine examination and the Wassermann test were negative.

Before consulting me, she had been under the care of Dr. E. T. Corson of this city, who had prescribed a salve and applied electricity to the affected lid, with some beneficial effect.

Examination showed a complete alopecia of the left upper lid, with a normal supply of lashes elsewhere, and with unaffected brows or hair of the head. The eyes and adnexa were also of normal appearance, with the exception of a slight widening of the left palpebral fissure, this being occasioned by a slight retraction of the lower lid. There was no scarring along the margin of the affected lid, and no other evidence of a previous inflammatory condition of that structure.

The patient was directed to rub a stimulating salve of ammoniated mercury along the margin of the lid once daily, and was referred to her family physician for proper general treatment with iron and strychnin. A message received from her a few days ago was to the effect that she saw evidence of the return of the lashes.

ALOPECIA OF THE EYELASHES

Cases similar to the foregoing, illustrative of the condition designated as alopecia of the eyelashes, by which is understood the partial or entire absence of the cilia due to conditions other than local inflammations of the lid, are rare. Loss of the lashes from local disease of the lids is, as is well known, extremely common, and will not come under the scope of the present communication, as I shall confine myself to an analysis of causes arising elsewhere than in the lids themselves.

Regarding the genesis of alopecia, it may be noted that the literature contains quite a few instances of congenital origin, some of which show the influence of heredity. Michel[1] refers to cases reported by Pincus of a father and son: The former had few cilia and no mustache; the son, little hair on the head, and scanty brows, but well developed cilia. Four brothers and sisters between 8 and 22 years of age were cited by Baer, with scanty cilia and brows perfectly bald. Cases such as these are to be regarded as due to retarded development, and are frequently associated with other anomalies of the eyelids.

Dermatologists record the condition as occurring in leprosy, leukoderma, pityriasis and seborrhea. In Steindorff's case of vitiligo and traumatic poliosis, the whitening of the skin of the left side of the forehead and of the hair of the scalp, eyelids, eyebrows and lashes of the left side followed a blow. The hairs of the scalp recovered their natural brown, but the eyelids, eyebrows and lashes remained white. Syphilis is a frequent cause of alopecia, gumma of the lid depriving that structure of its lashes in a complete and characteristic manner, while the cilia may fall out without previous inflammatory symptoms, in association with the loss of hair in other parts of the body which is so frequently observed in constitutional syphilis. Thus, in 136 cases of syphilis observed in the early stages, Wilbrand and Stähli found a loss of cilia alone in 5.1 per cent.; of the brow alone in 8.8 per cent., and a simultaneous disappearance of cilia and brows in 33.3 per cent.

Alopecia has been observed in connection with chronic arsenic poisoning, either as a local condition or accompanying the loss of hair in other parts of the body.

In a case of fatal hemiatrophy, Berger[2] reported falling out of the cilia simultaneous with that of the eyebrows and hair of the head.

Scarlet fever has been known to cause loss of lashes. An interesting case is recorded by J. T. Shoemaker,[3] following an attack of measles at 6 years of age. Nearly all the hair of the scalp fell out, most of which came in later; the eyebrows and eyelashes were entirely absent; a few axillary and pubic hairs developed. At the age of 18, some fuzzy hairs of a lanugo type grew on the face. At about 23 years of age, the patient became entirely bald, and has remained so. The hair

1. Michel, in Graefe-Saemisch Handbuch, Ed. 2, 5: 287.
2. Berger: Deutsch Arch. f. klin. Med. 21: 432.
3. Shoemaker: Ophthalmic Year Book 13: 294.

of the face and other parts of the body was also lost. The Wassermann test was negative. The patient married and had three children, the first of which was prematurely born; the other two were normal, with the usual development of hair; this was also true of the patient's parents. The man himself appeared perfectly healthy. In conjunction with this case, Shoemaker discussed the functions of the ductless glands with reference to various trophic conditions, and came to the conclusion that his patient had some form of dysendocrinism due to a diminished secretion of the endocrine glands (pituitary body, pineal glands, thyroid, parathyroid, thymus, suprarenals, pancreas and testis), but was unable to state what particular glands were affected, though, judging from the part which the thyroid and the gonads (testis) seem to play in the growth of hair, he thought it probable that these may have been the ones at fault.

Alopecia of the lids, in connection with disturbances in the thyroid gland, has occurred in the practice of a number of observers. Most interesting of these is a report by Yeo [4] of a case of exophthalmic goiter in a young woman in whom the hairs of the eyebrow and eyelids fell out coincidently with the protrusion of the eyeballs. The symptoms manifested themselves in this order: first, the projection of the left eye and enlargement of the right lobe of the thyroid, with the shedding of the hairs of the left eyebrow and eyelashes; then the slighter enlargement of the left lobe of the thyroid with the slighter but simultaneous projection of the right eyeball, and shedding of the hairs of the right eyebrow and eyelids.

In a young girl with exophthalmic goiter, observed by Wilbrand and Saenger,[5] not a hair of the lashes or brow remained, giving the patient a most unpleasant expression. Von Molliere and Choostek saw similar cases.

Alopecia neurotica is the name given to loss of cilia through so-called "nervous influences." Michel has found this of rare occurrence, and usually associated with change in color of the eyelashes. He asserts that the process is in all probability that of a trophoneurosis, especially when the loss of cilia is unilateral. The case that I reported is probably of this origin, doubtless associated with some obscure nutritional change, emanating from disordered glandular function.

Of not uncommon occurrence is so-called hysterical alopecia of the eyelids. Twenty years ago, Gifford [6] cited the cases of two girls, aged 10 years, who had acquired the practice of pulling out the lashes. Since then, this author writes that he has probably seen a dozen additional cases of this trouble. In some of these the habit extended to pulling out nearly all the eyebrows as well as the eyelashes. In fact, from a condition with an hysterical element, or at least an element reveling in the excitement and alarm caused by the patient's environment, Gifford points out that the practice gets to be a more or less permanently fixed habit, which it is difficult or impossible for the patient to get rid of even when he (or more generally she) actually wants to stop.

The same author suggests that a better name for the condition might be trichomania or trichotillomania or something of that sort, a term used by dermatologists for cases in which, sometimes, the habit extends to pulling out a good deal of the hair of the head.

Revaton saw discoloration and falling out of the hair of the head and of the right brow and cilia after a head injury which caused blindness of the right eye. Velardi's [7] case, that of a boy, aged 16, in whom all the cilia of the left upper lid and the right lower lid fell out two days before the occurrence of a severe headache and a slight attack of fever, is also of interest. No disease of the lid margin or parasitic disease of the rest of the hairy parts was present. Heavy doses of quinin relieved the headache, and the cilia grew in again completely after several months.

In a case of double trigeminus affection and bilateral keratitis neuroparalytica reported by Sachsalber [8] there arose symmetrically, corresponding to the region of supply of the first branch of the fifth nerve, alopecia areata and catarrh of both sides of the throat and nose. Wilbrand and Saenger think this case and others present strong evidence of trophic qualities in the fifth nerve.

Schüle [9] graphically describes the manner in which the insane occasionally pull out the eyelashes, and even at times rub sand into the conjunctiva. In concluding this part of the paper, I may quote from Lawrence's standard textbook, written a century ago:

> I saw a young lady in whom the lashes of one upper eyelid had dropped out without previous inflammation or any other ascertainable change in the part. My opinion was that they would not be reproduced; but I recommended the trial of a stimulating ointment, and the ung. hydrarg. nitrat. in a dilute form was consequently employed. After the lapse of some months the hairs again appeared, and were ultimately restored, of natural size, color and number.

POLIOSIS OF THE LIDS

Closely allied to alopecia, or falling out of the lashes, is that of loss of color, graying and whitening of the lashes—poliosis of the lids, so called. As an instance of this condition, which is not nearly so rarely encountered as the former, I may cite this case:

> Mrs. H. W. T., aged 42, consulted me in March, 1920, for glasses to correct presbyopia. In the examination, it was noted that the hair of the right eyebrow was entirely white, and the lashes of the corresponding side similarly affected except for one or two in the lower lid which had retained their original color (dark brown). The hair of the head was dark, with the exception of a white patch in the right temple. This blanching process had been accomplished during the three months preceding, and was of unknown origin, the health of the patient having been fairly good. There had been no history of accident or nervous shock. Dr. Schamberg was consulted, who, finding a low blood pressure and other evidences of a poor circulation and chronic constipation, placed the patient on a strict regimen as regards diet, etc., and suitable cardiac tonics. No improvement being manifest within a short time, the patient discontinued all treatment, and the condition has remained unchanged.

As with alopecia of the lid, partial or total lack of pigmentation of the cilia may be congenital. Streatfield [10] reported such a case confined to the cilia of one lid. Wilde saw one brow totally white, the other half white and half normal, congenital; Michel, a congenital light coloration of the cilia of both left eyelids, with hair of a light coloration of the front of the head, especially of both temporal regions. In another of his patients, a child aged 8 years, a partial discoloration of otherwise normal cilia, with a whitish discoloration of the points of the cilia, with a sharp line of demarcation from the brown of the hair pigment, dated from birth.

4. Yeo: Brit. M. J., No. 12, 1877.
5. Wilbrand and Saenger: Die Neurologie des Auges.
6. Gifford: Ophth. Rec. **10**, No. 1
7. Velardi, in Nagel's Jahresbericht für Ophthalmologie **12**: 438.
8. Sachsalber: Wien. klin. Wchnschr., 1893, No. 36.
9. Schüle: Allg. Ztschr. f. Psychiat. **39**: 1.
10. Streatfield: Lancet, July, 1882.

The color of the hair is due mainly to the varying amount of pigment granules and diffuse pigment present in the cortex or body of the hair and the medullary portion. The presence of air, usually as thick vesicles, is also doubtless an important factor, especially in light brown, white or gray hair. Stelwagon says it is presumably owing to a rapid evolution of air vesicles that sudden graying of the hair is produced. Under ordinary circumstances, in graying of the hair, the scalp hairs are usually the first to become gray; later the bearded parts share in the blanching, although in some instances the bearded parts suffer first. Still later and usually slight and long deferred, the eyebrows, and finally the other general surface hairs, may undergo depigmentation. Although occurring much more rarely than one would be led to believe by the more or less frequent accounts in general literature of the hair being made white over night by grief or shock, there are well authenticated instances in medical literature of such occurrences. Stelwagon [11] speaks of a man who, within a week after an accident, lost all the hair from his scalp and later from the brows and eyelashes. The same author goes on to say:

> Instances following injuries to the scalp are also reported by Schütz, and extensive development—universal alopecia—has been observed after severe fright by Boisser and Bidon. Malcolm Morris mentions a case in which total alopecia occurred in a woman within forty-eight hours of receiving news of the death of her son. Other examples have been referred to by Duhring, Crocker, Duckworth, Steppe and many others. Indeed, the clinical proof that fright, shock, accidents, great anxiety and mental worry, etc., are the causative factors in many cases is overwhelming. Jacquet's belief, that it may be due to peripheral irritation from defective teeth, has not received much support; nevertheless, it is not impossible that such reflex irritation as from this source as well as from defective vision, nasopharyngeal disorders, etc., may be influential in some cases.

Stelwagon says that the question of heredity in the extensive or generalized examples has received no attention, though he himself had observed two instances in which the family history disclosed a similar condition in a member of a preceding generation. In these two were involved three patients, all males, two of whom were brothers. The alopecia, beginning as an ordinary case of alopecia areata, in all about the age of 3 or 4 years, rapidly spread and involved the entire scalp, eyebrows and eyelashes, and the down on some other parts. Inquiry elicited the fact that in both instances a grand-uncle had had the same misfortune, likewise developing it early in life.

A century ago, Demours, in his Traité des maladies des yeux, stated that the eyelashes, like the hair of the head, can become rapidly white after prolonged psychic excitement, and he cited the case of a pregnant woman in whom the cilia of the right eye became white after a great fright, a miscarriage occurring eleven days later.

Von Roose [12] reports a case of a youth, aged 17 years, who received a fright in the night, and the next morning the eyelashes on the right side were white.

An acquired whitish coloration of the cilia may result at times from the inflammation of the margin of the lids accompanying certain skin affections, such as vitiligo, and also in progressive facial hemiatrophy.

Wilbrand and Saenger saw discoloration of the cilia affecting the upper lid of one eye alone, in a young man who suffered from repeated attacks of migraine, while, in an epileptic observed by Räuber, there was periodic recurring change in the color of the hair of the head, the eyebrows and cilia remaining unchanged.

Bock [13] reported a number of cases in which the changes in the color of the cilia came on after affections of the fifth nerve, after hemicrania, and especially in association with sympathetic ophthalmia and painful affections of the eyeball.

In this connection, it will be of interest to recount the narrative of an example of local blanching of the eyelashes, cited by Jonathan Hutchinson: [14]

> A very neurotic woman, aged 29, fair, with reddish auburn hair, was brought to me with hysteria, bordering very closely upon insanity. Her appearance was striking, owing to the lashes on the inner half of the upper lid of the right eye being quite white—strikingly so. The whiteness began in one lash only in the center, and from that spread inward to the nose. This occurred ten years ago on a voyage from Australia. There were no gray hairs in the head, but latterly some have shown in the inner quarter of the right eyebrow. She has had no blow or injury, or inflammation about the eye; no illness, and no neuralgia or headache; but there is a mark of a leech-bite close to the outer canthus of the right eye, which she thinks was put on after a severe attack of measles which she believes caused her at that time some temporary blindness (at the age of 5). Her health has always been good. Her mother died of phthisis two years after giving birth to her.
>
> I have seen several cases of local bleaching of the eyelashes, more or less similar to one recorded above. Mr. Warren Tay has shown me at least one such case. I possess a good portrait illustrating this condition in a man who had suffered from a very peculiar form of destructive iritis. He had lost both eyes, and in both upper eyelids, placed quite symmetrically, there were tufts of white eyelashes. His eyebrows and the rest of his eyelashes remained of their natural brown tint. There can be little or no doubt that these changes are brought about from lesions of the nervous system, and in that relation they are of great interest.

Vogt,[15] who has contributed the most comprehensive paper on poliosis of the eyelid, was able to trace a connection, the nature of which was, however, unknown, between this condition and some form of iridocyclitis, especially that due to sympathetic disease, in 39 per cent. of all cases in the literature. Schencke observed gray cilia in both the exciting and the sympathizing eye; Jacobi,[16] Nettleship,[17] Bock and Tay [18] in the sympathizing eye. Reich [19] noted that the cilia became white on the side of the operated eye two or three weeks after a painful cataract operation; Bach, discoloration of the cilia after eye injuries.

Fuchs [20] has thus epitomized his experience:

> In severe cases of iridocyclitis (especially of sympathetic origin) blanching of the cilia of the lids of the affected eye is sometimes observed.

Poliosis of the lids can apparently be spontaneous and without known cause: thus, Hirschberg [21] saw partial whiteness of the cilia in a healthy girl, aged 14 years, with healthy eyes. The right palpebral fissure was somewhat smaller than the other (sympathetic nerve). The lids were normally sensitive. The white cilia occupied the middle third of the upper lid. In the lower lid, white bundles alternated with black. The

11. Stelwagon: Text-Book on Dermatology.
12. Von Roose: Ann. d'oculi. **122**: 314.
13. Bock: Klin. Monatsbl. f. Augenh. **28**: 484.
14. Hutchinson: Arch. Surg. **4**: 357, 1892.
15. Vogt: Klin. Monatsbl. f. Augenh. **44**: 228.
16. Jacobi: Klin. Monatsbl. f. Augenh., 1874, p. 367.
17. Nettleship: Tr. Ophth. Soc. U. K., 1884, p. 76.
18. Tay: Tr. Ophth. Soc. U. K., **12**: 29.
19. Reich: Arch. d'Ophth. **1**: 307.
20. Fuchs: Text-Book on Ophthalmology.
21. Hirschberg: Centralbl. f. Augenh., January, 1888, p. 15.

discoloration of the cilia was increasing. Rindfleisch [22] and Ponti have reported somewhat similar cases.

An instance of the central part of the lashes of the right upper lid of a healthy brown-haired girl, aged 18 years, becoming white in a week's time has been cited by de Schweinitz. No cause could be found. Both eyes were myopic.

CONCLUSION

Attention may be drawn to the length of time concerned in the process. In Rossi's case the discoloration came on over night, in Schenkel's,[23] in three days, and in de Schweinitz's, in one week. In the cases of Hirschberg, Reich, Rindfleisch, Ponti, Herzog and Michel, the period varied from between five and fifteen days to several months.

2049 Chestnut Street.

OPERATIVE TREATMENT OF CERTAIN FRACTURES OF LONG BONES*

JOHN J. MOORHEAD, M.D.
NEW YORK

It is generally conceded that the "closed," or nonoperative, method of dealing with certain fractures is so unsatisfactory and uncertain that in selected cases "open" or operative reduction is justifiable. To avoid operating in that class of case in which closed reduction is impossible, resort is frequently made to skeletal traction by use of the tongs (calipers), a transfixion nail, or a metal band (stirrup).

This procedure of skeletal traction is, strictly speaking, an "open" or operative method; but, because the procedure is relatively simple, requiring a small incision, it is finding increasing favor and is properly regarded as an intermediate method between "closed" and "open" reduction. For the purpose of selecting a type of treatment in my own services we have for some time divided all fractures into two general "types," either of which may be simple (closed) or compound (open). Type 1 is that group in which the fragments are overlapped, malalined or disconnected by an amount equal to at least their own diameter. Type 2 is that group in which the fragments, while perhaps separated, are neither overlapped, wholly disconnected, nor grossly malalined. In Type 1, treatment is based on the necessity for reduction (setting) and retention (splinting). In Type 2, retention (splinting) is alone required. Obviously, operative reduction in Type 2 is almost never required, but in Type 1 there are many cases in which "closed" or nonoperative reduction is impossible, and hence this class falls into the "open," or operative reduction group. That group in which "closed" reduction is impossible or improbable is termed by me the "irreducibles," and in these the choice of treatment is as between "open" reduction and skeletal traction.

EXTERNAL AND INTERNAL TRACTION METHODS

The essential object in the treatment of a Type 1 (overlapping) fracture is to convert it into a Type 2 (nonoverlapping) fracture, just as the object in treating a compound (open) fracture is to convert it into a simple (closed) fracture. In the last analysis, all bony displacements are corrected by traction, and our manipulation may be (1) manual, (2) mechanical or (3) operative.

1. Manual traction is the accepted method applicable to many fractures.

2. Mechanical traction is applied by means of (*a*) the fracture table, or by (*b*) straps fastened to the parts, and these in turn are suspended in apparatus and attached to weights.

Experience shows that reduction once attained on the table may not always be retained, because deformity often recurs as soon as the splintage (usually a plaster-of-Paris cast) loosens. Likewise, the necessary hiding of the part in such a dressing is not without danger (pressure on the soft parts; circulatory embarrassment), and there is no opportunity of mobilizing joints; massage and motion are impossible, and thus splintage of this sort prevents attention to the associated pathologic conditions of most fractures, namely, myotenosynovitis, arthrosynovitis hematoma, ecchymosis, blebs and neural or vascular damage. Hence this method is less employed than formerly.

Traction and suspension in fractures of the upper extremity means bed treatment for a class of case in which ambulatory treatment is usually indicated, or at least is provided.

In the lower extremity, my own preference is for skeletal traction rather than for traction by straps, because I have been unable to attain reduction satisfactorily or uniformly by straps except in minor grade Type 1 cases or in compound fractures. The vogue for strap traction found greatest impetus in military fractures, and in these the treatment is excellent and very satisfactory. However, it is well known that muscle resistance is relatively inactive in a compound fracture (especially if debrided) and very active in a simple fracture.

Strap traction and suspension is an admirable method in selected cases in which supervision in the hospital or home can be constant and intelligent; but in the average hospital or home, this method has not been as universally satisfactory as we had hoped. For example, in overlapping fracture of the lower end of the femur or tibia it has often failed in my hands, and it has been virtually abandoned except in certain selected simple, and in some compound, fractures. In passing, we must not forget that this method is the Buck's extension method with modifications.

These preceding (1) manual, and (2) mechanical traction methods may be termed "external traction" methods. The "internal traction" method will now be described.

3. Operative traction is applied by means of (*a*) skeletal traction or (*b*) direct traction. In skeletal traction, the tongs, nail or stirrup are used. These appliances are most useful for fractures of the tibia or femur. Direct traction is applied by cutting down on the fracture site and prying apart ("jimmying") the bone fragments. If they are notched (dovetailed), they will probably remain alined if brought together and jammed; if not, then they are deliberately notched. The bone ends may also be held by chromic or kangaroo tendon passed through holes or bound around the fragments. Some surgeons use a metal plate or clamp on the fragments. Wire, screws, steeples and a variety of metallic devices have also been used.

Bone inserts are usually reserved for later cases, or for definite nonunion or bony loss of substance. For

22. Rindfleisch: Klin. Monatsbl. f. Augenh. **40**: 53.
23. Schenkel: Arch. f. Dermat. u. Syph. **5**: 137.

* Read before the Medical Association of the Greater City of New York, Jan. 15, 1923.
* From the Department of Traumatic Surgery, New York Post-Graduate Medical School and Hospital.

very good reasons, the use of buried metallic substances in fracture treatment is now very much restricted, and shortly will be employed about as often as is silver wire in the repair of a hernia or a cervix.

COMMENT

The preceding survey briefly reviews the accepted methods in fracture treatment, and it is safe to say that no part of general surgery is today receiving greater attention than fracture surgery, an important part of traumatic surgery.

The deficiencies of skeletal traction in certain cases of fracture of the leg focused our attention on the possibilities of "open" or operative correction in this location. For a long time it has been our custom to operate on Type 1 (overlapped) fractures of the forearm, because by any other method we were never certain of attaining reduction. In the lower tibia nonunion was very frequent in my own cases, and presumably other surgeons were also having similar difficulty, so that it soon became evident that nonunion in the lower third of the tibia was more common than in all other parts of the body combined. Next in order in nonunion was the radius, next the ulna, and next the humerus.

In this nonunion group at operation it was demonstrated that nonunion usually meant noncoaptation of fragments because soft parts (muscle, fascia, tendon, aponeurosis) or bony spicules intervened. Virtually, then, a spontaneous arthroplasty occurred when soft parts intervened, and nonunion was a sequel despite relatively accurate coaptation of fragments. For example, the periosteal and fascial coverings of the lower tibia are relatively thick, so that a fringe of torn soft parts frequently overlaps the fragments after the manner of a fractured patella. Under these conditions, not only is it difficult by external methods to engage or notch the bone ends one with the other, but even if they are notched, the interposed soft parts act as would soft parts deliberately interposed to prevent union. This failure by the "closed" reduction occurs so regularly in fracture of the shaft of the ulna or radius (or both) that direct exposure of the fragments is now our method of choice. Since Sept. 15, 1922, eleven cases of this sort have been thus treated, and the success attained directed attention to such an extent that "open" reduction was used in certain fractures of the leg also.

When the fragments of a broken forearm or leg are exposed to direct inspection at operation, it is often surprising to note the extent of the damage, and the wonder is that satisfactory union is so often attained by the "closed" method. The contiguous muscles are torn, and bony fragments are often covered by or pushed into muscular, fascial or periosteal bundles. Many bony spicules, some not seen in the roentgenograms, are frequently found, and some of these may be quite denuded of periosteum and may even be jammed crosswise into the medullary cavity. The hematoma about the bone ends is often extensive, and this, of course, is greatest in an area normally quite vascular.

Now the objection to "open" reduction is that in the majority of cases it is not needed, especially if skeletal traction is used. The other objection is the danger of postoperative infection. A third objection is that based on the necessity of providing some means to *retain* reduction even after the operation enables us to *obtain* it. To meet this objection, Lane in 1894 sponsored metal plating, and thereupon fracture treatment entered on a new epoch, bringing broken bones into the operative class, and thus attracting a group of surgeons until then mainly concerned with and skilled in other fields of surgery.

This was a good thing for fracture surgery because, among other benefits, it definitely and very dramatically demonstrated that the reduction of the fracture, even by operation and plating, was in reality only the initial stage of treatment, and that often the determining factor was after-care, if maximum function was to be attained. This after-care phase of traumatic surgery is unattractive to some surgeons who, by precept and practice, naturally enough look on the operation as the principal, and in many cases, the only treatment of importance. Another deterrent was the realization that traumatic cases regularly show a higher rate of postoperative infection than nontraumatic or pathologic cases, herniotomy not excepted.

This tendency toward easier infection is dependent on several elements, in my opinion. The first is that traumatized tissue is less resistant than nontraumatized tissue. The second is that, in fractures particularly, blood and serum has been thrown out, muscle has been macerated, and in effect the operation is performed in a culture medium of bouillon, an autogenous culture, made up of the patient's own blood, serum and macerated muscle. If into this is introduced infection from the skin coccus which lodges in the skin of every patient, it is not surprising that pus is formed under circumstances in which every surgical precaution has been taken to prevent this very thing. A third reason is that, in my opinion, many patients are virtual carriers of infection, and that from an infected focus organisms migrate to the traumatized area and find in the autogenous culture medium described above a most suitable incubating habitat. Skilled surgeons soon found that bone plating was a hazardous procedure even when practiced with that grade of hyperasepsis advised by so dexterous a surgeon as Lane. Hence the method has been less and less employed, and, indeed, the introduction of nonabsorbable buried material in any form of surgery is now regarded as a very exceptional requirement.

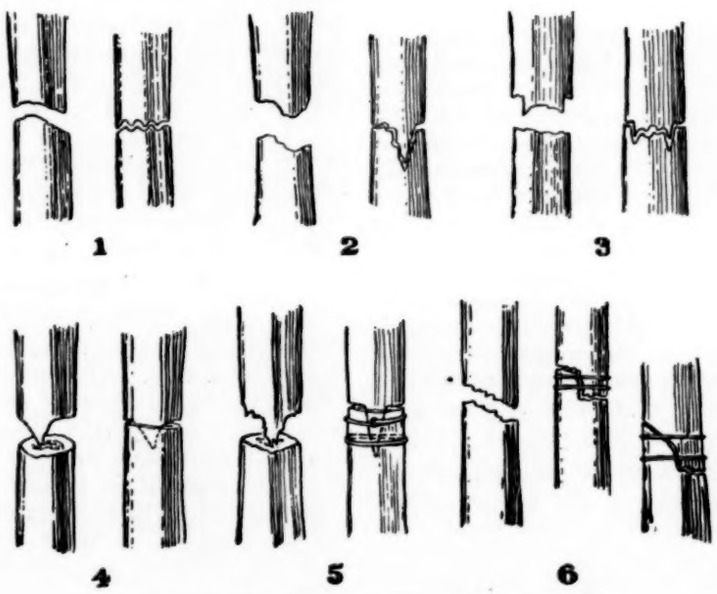
The lessons learned from this plating epoch in fracture treatment have been extremely valuable, and among other things we learned that a fracture is a lacerated wound of bone and, like any other laceration, would heal best when the edges were promptly and accurately brought together and held thus by some means that would neither constrict nor yet permit too great latitude of motion. Accurate coaptation of severed bone edges brings about primary union just as in severed soft part edges; the reverse means secondary union. In the one case we obtain a minimum, and in the other a maximum of scarring, whether we call this "scarring" callus or granulation tissue. However, despite relatively perfect coaptation of fragments, we are often confronted with nonunion, and this occurs notably, as stated, in very important bones, namely, the tibia, radius, ulna or humerus. Joint fractures, however, neck or femur excepted, heal with great regularity, and it is very rare, for example, to see nonunion in a Colles' or Pott's fracture. The reason is probably the greater blood supply of joints and the lessened opportunity for the interposition of soft or hard parts.

It is, of course, well known that a cabinet-maker's type of coaptation is not necessary to bring about a functionally satisfactory result; but it is equally well

known that, the more accurate the coaptation, the earlier and more certain the repair. More and more we are appreciating that nonunion usually begins as malunion, in that imperfect reduction has prevented bridging of the gap by the form of granulation tissue that we call callus. The next factor in nonunion is imperfect splinting, too tight or too loose, for a splint is to severed bone what a suture is to severed skin. Experience shows that many fractures cannot be disengaged from surrounding soft parts even by adequate and prolonged traction, and it is to this class that "open" reduction is applied. This group, as stated, is in the forearm mainly, and to a lesser extent in the leg and arm.

I am not partisan to unrestricted "open" reduction in long bones, except for the forearm, because in this location skeletal traction is inapplicable. In the femur and tibia, skeletal traction is applicable and is usually efficient. In the humerus, manual reduction is usually possible; if not, traction and suspension may be used if the patient will remain abed; if not, "open" reduction can be employed here also.

As related in the preceding, "open" reduction is of no great value unless it can be maintained, and heretofore for this we have been forced to rely on plating, wiring, screws or other metallic or nonabsorbable sutures. Intramedullary tubes were advised some years ago, and Elsberg and others used aluminum for this purpose. Magnesium tubing has been employed with the same object. After reasonable trial, both of these have been discarded.



Various methods of "notching" and "steepling" fractures.

It has long been known that, when fragments are jagged, dovetailed, spikelike or otherwise serrated or notched they are readily impacted one into the other. Conversely, it is also known that smooth transverse or smooth oblique fragments are difficult to coapt. This principle of "notching" has been employed in the series of cases herein reported, and success by this procedure has been so gratifying that in future many recent and old cases previously subjected to nonoperative reduction will be managed by this method.

The time to operate is within the first thirty-six hours, if possible, the earlier the better if there are none of the usual operative contraindications.

THE STEPS IN THE PROCEDURE

1. Incision. This adequately exposes the underlying bone, and is planned to conserve the soft parts, especially the neural, vascular and tendinous structures. The parts have previously been shaved and covered for twenty-four hours in an iodin solution dressing.

2. Extrusion. The bone is extruded by markedly bending the limb or by the use of suitable bone forceps, elevators or skids. Special bone-holding forceps of the Lambotte type are very useful, as is the bone skid device of the late John B. Murphy.

3. Excision. All débris is removed from the bone ends, especially overhanging periosteum, fascia and muscle. The medulla is demonstrated to be patulous. The surrounding soft parts are rendered free of blood clots, frayed soft parts or loose or denuded bony spicules.

4. Notching. The fragments are tested to determine whether, when apposed, they remain of themselves in position. If not, they are deliberately notched by a rongeur, chisel, saw or the "bone notcher," thus: (*a*) serrated edges (Fig. 1); (*b*) irregular edges (Fig. 3); (*c*) steeple edges (Figs. 2, 4 and 5); (*d*) oblique edges (Fig. 6); (*e*) shaped edges (Fig. 6). In any of these, holes may be bored and kangaroo or chromic sutures passed for greater security. Jamming the fragments will materially aid in holding them. The type shown in Figures 2, 4 and 5 affords great firmness in that lateral motion is prevented by the "steeple" passing into the medulla of one fragment; usually the upper fragment is pushed into the lower. The "steeple" should project one-quarter inch or more. If the edges are not straight in the long axis, it usually makes little difference because the overlapping is the essential fault to correct. Shortening is to some extent caused by this procedure, but in most instances this will amount to but little. In the smooth transverse varieties, a bone segment 2 inches long can be taken from one fragment, placed in the medulla of each fragment (virtually a medullary plug), and held there by chromic or kangaroo tendon.

5. Hemostasis. This should be complete, and every effort should be made to leave no clots or blood pools, which are virtually culture mediums.

6. Suture. Catgut, interrupted, is employed for the muscle and fascial layers, special effort being made to cover the fracture line by untorn soft parts. Skin sutures of interrupted nonabsorbable material are used, silk, cotton, linen, silkworm or horsehair.

7. Drainage. Rubber tissue, rubber band or pipe cleaner is used if the parts have been much macerated or there is free bleeding. Drains are taken out in from twenty-four to forty-eight hours. No drainage is employed if the contrary obtains.

8. Dressings. These are of gauze wet in some mild antiseptic (as iodin-saline, which consists of tincture of iodin, 1 dram, to saline solution, 1 pint). This is used to prevent skin infection from the ever present skin cocci.

9. Splintage. Two-piece molded plaster-of-Paris splints are used, including the distal and proximal joints.

10. After-treatment. Passive motion to contiguous joints is used after the first few days, the principle of "guarding" the fracture, while so doing, being employed; that is, encircling the fracture site by a firm grasp and thus "guarding" against motion of the fragments. "Guarded" active motion begins when passive motion causes no reaction in terms of persistent pain, heat, redness or swelling: in other words, when no "hot box" develops on motion of the joint. Massage is taken up when the stitches are removed, usually after the seventh day. When "firm" union is obtained, one half of the splint is removed. I call "firm" union that stage in which healing has progressed enough to give a "lead pipe consistency" to the union. When "solid" union is obtained, the remaining half of the splint is removed. I call "solid" union that stage in which healing has reached the "iron pipe consistency." In the lower extremity, "walking calipers" are used after the plaster is removed, and thus the patient is more promptly permitted to walk with all the attendant advantages of becoming ambulatory instead of nonambulatory.

The foregoing plan of early but safe activation of the parts makes the later use of physiotherapy less necessary. Physiotherapy should rarely become a terminal necessity in fracture treatment; on the contrary, it should usually begin shortly after the bone has been set. Open reduction should so set or impinge the fragments that our attention thereafter can be directed to the pathologic changes associated with every fracture; namely, myotenosynovitis, arthrosynovitis, and vascular and neural damage. To forget or neglect these associated lesions is just as reprehensible as to forget or neglect the concomitant lesions of a ruptured appendix after appendectomy. By a laparotomy we may save life by removing a source of peritonitis; but we restore function only if we prevent adhesions or postoperative hernia.

ADVANTAGES OF THIS FORM OF TREATMENT

(*a*) More accurate coaptation means firmer, earlier union in more exact alinement; in other words, we have produced that grade of correction we call "anatomic reduction" as opposed to "surgical reduction."

(*b*) With the assurance that definite coaptation has been obtained, there is less danger of interposition of soft or hard parts which would prevent or impede union.

(*c*) Primary neural or vascular damage is more readily discovered and corrected; secondary neural or vascular damage from pressure or callus inclusion is very unlikely.

(*d*) Fractures of this carefully selected type are made problems in general surgery, thus attracting to this important field the grade of surgeons who have done so much in other branches of surgery. This will inevitably make fracture treatment much more exact and more progressive, to the end that the patient and the profession will equally benefit.

(*e*) This selected form of fracture treatment should eventually supplant the use of nonabsorbable internal splints in that its development will make unnecessary the use of plates, screws, nails or wires in a group of cases in which metallic material is even now too frequently employed.

DISADVANTAGES

(*a*) Fractures are put into the operative class with the attendant risks of anesthesia and infection. This cannot be denied, and the only answer is that we should develop a technic that will make this procedure as safe as the modern laparotomy. In my opinion, many fractures of long bones are major surgery problems and should be so regarded.

(*b*) The method is needlessly severe and dangerous, since good results have heretofore been obtained by simpler methods. As stated, this method should be reserved for a selected group of cases in which prior experience indicates that nonoperative treatment frequently leads to failure, as denoted by nonunion, deformity or disability. I do not subscribe to the view that the older surgeons obtained better results than are now obtained, but do concede that they made better use of their special senses for diagnosis than we do. They lacked the checking up afforded by the roentgen rays as to the actual result of setting, and I am quite sure that they had a group of patients more willing than ours by their own efforts to overcome disability incident to injury. Also, they did not encounter the same types of fracture because the industrial and transportation situation of even twenty-five years ago was vastly different. The greatest single cause of injury today is the automobile; and when the coming generations reach the flying stage, they will probably say that we also did not know what a real fracture was.

(*c*) It is inapplicable for general use. That is true to the same degree that every special process is not adapted to general application.

(*d*) It produces shortening. This is usually slight and of no importance.

INDICATIONS

The method is particularly adapted to recent displaced or old malunited fractures of the shaft of the radius, ulna, tibia and humerus, in the order named. The femur is not included because skeletal traction is here so effective. Joint fractures are usually amenable to closed correction, perhaps excepting those of the elbow and some at the shoulder and ankle.

In children up to 16 years of age, open correction is less often needed; however, many forearm cases, even in young children, are operative problems from the onset.

In the aged, those of poor physique, the diabetic, the arteriosclerotic—these are the bad risks for any surgical procedure, and operation is often as much contraindicated for a fracture as for a hernia. Under such circumstances we shall probably continue to resort to "truss" treatment, for that is exactly what our fracture therapy now is in too many cases.

115 East Sixty-Fourth Street.

Hospital and Dispensary Personnel.—The purpose of a hospital or dispensary is to meet the need of physically or mentally defective individuals whatever may be the contributing or underlying cause of such defects. Beginning with the chief executive down through the various departments wherever the medical situation dominates there is definitely required a medical or nursing personnel. In the cause of effective and economic service, such personnel should be relieved as far as possible of the nonmedical features of the case through the service of other workers skilled in such features, not less also in the cause of economic efficiency should the medical workers be expected to have such knowledge of the nonmedical aspects of the case as to understand the importance of their relation and furthermore to deal with such aspects where the body of the work will not justify the two specialists.—A. W. Goodrich, *Hospital Social Service* 7:169 (March) 1923.

AN ANALYSIS OF SOME CASES OF TUBERCLES IN THE TONSIL

W. V. MULLIN, M.D.
COLORADO SPRINGS, COLO.

Tuberculosis of the tonsils and adenoids occupies an anomalous position in oral surgery, as this lesion is not recognizable clinically, and is seldom even suspected until the tissues have been sectioned by the pathologist.

There are two conditions in which the tonsils are frequently found to be tuberculous: 1. In advanced pulmonary tuberculosis, the tonsils will show tubercles in the majority of cases. 2. In tuberculous cervical adenitis, the tonsils will show this infection in approximately one half of the persons examined.

Ulcerative lesions of the mouth and throat as seen in the terminal states of pulmonary tuberculosis may involve the tonsils, but the process is seldom limited to these structures. These cases have an entirely different significance, and are, therefore, not included in this analysis.

Perhaps the most comprehensive early work in this country on tuberculosis of the tonsils was done by G. B. Wood,[1] who has added contributions to the subject from time to time. Reports on large series of tonsillectomies in which the tissues were examined for tubercles were made by Weller,[2] from the University Hospital, Ann Arbor, Mich., and another by Crowe, Watkins and Rotholz,[3] from the Johns Hopkins Hospital. Levy [4] has written on the tuberculous tonsil as a clinical entity. The literature on all phases of this subject is liberally quoted in the reports just mentioned.

This analysis is based on 400 consecutive tonsillectomies in Glockner Hospital, Colorado Springs, in which the tissues were sectioned and examined microscopically. The series covers a period from June, 1921, to December, 1922. These cases have all been in private practice. The patients are all living, and are under the continuous observation of myself and my associates. On this account they may allow of more advantageous study than larger series of patients observed under less favorable conditions. The pathologist reported seventeen of these patients, or 4.25 per cent., as showing tuberculosis of the faucial or pharyngeal tonsils, in various combinations. A careful review of the histories of the seventeen cases shows no characteristics, such as size, color or appearance, which might serve to identify the tonsils as tuberculous before they reached the microscope. These cases will be considered mainly from the point of view of the clinical significance of removal of a tuberculous tonsil.

A classification which naturally suggests itself and is commonly used divides the cases into primary and secondary infections. Such a division is more or less arbitrary and is not susceptible of proof for the given case, but nevertheless it has considerable value. Open pulmonary tuberculosis accounts for practically all of the secondary tuberculous infections of the tonsils. Sixty per cent. of the positive cases in this series gave a history of pulmonary tuberculosis. This high proportion is accounted for by the large number of lung cases under treatment in Colorado. That these tonsillar lesions are secondary to the pulmonary disease is clearly indicated by the fact that in 70 per cent. of them, both tonsils were involved. Twenty-five persons were known to have pulmonary tuberculosis, and of these, ten, or 40 per cent., were found to have tubercles in the tonsils. This is in accord with the usual findings. The proportion increases in advanced pulmonary tuberculosis, until the percentage at postmortems averages 70 or more.

Primary tuberculosis of the tonsils may be taken to include all cases in which there is no suspicion of pulmonary disease. This stand is purely arbitrary, and ignores, among other possibilities, hematogenous infections including miliary tuberculosis; but such cases must be few in number. Probably the most tangible problem in primary tonsillar tuberculosis is concerned with its relationship to the cervical glands.

It is generally believed that, in Colorado, tuberculous cervical adenitis is relatively infrequent. Certainly, this condition does not figure very largely in this series.

Of three cases of definite tuberculous cervical adenitis, two presented tuberculous tonsils or adenoids. In the cases reported from Johns Hopkins Hospital in which the glands were definitely infected and the tonsils were removed and sectioned, 50 per cent. of the tonsils were found to be tuberculous. An analysis of all tuberculous tonsils showed the cervical glands to be also involved in 50 per cent.

Five of our seventeen positive cases, approximately 30 per cent., gave no history or evidence of tuberculosis elsewhere. This is a little more than 1 per cent. of the total of 400 tonsillectomies. The importance of this group as presenting a possible portal of entry for pulmonary lesions must be left to the internists.

The adenoid is rather largely represented in these primary cases, and the reason is fairly obvious since the pharyngeal tonsil is not removed very frequently during the age period when pulmonary tuberculosis commonly becomes manifest. The total number of adenoids sectioned was small (167 cases) in comparison with the number of tonsils (390 cases). The percentage found to be tuberculous was: adenoids, 1.8 per cent.; tonsils, 3.6 per cent.

It is not surprising that the tonsils should so frequently become infected with the tubercle bacillus, situated as they are in the common portal of entry to the respiratory and gastro-intestinal tracts. The remarkable thing is that the tonsil resists so well the usual destructive action of this process. Since the tonsil is commonly infected, yet seldom presents clinical evidence of the disease, it must be inferred that the ultimate tendency of the local lesion is toward recovery. The pathologists have noted that hyaline and fibrous scars are common in the tonsils, and these may well represent an extinct infection.

I have been unable to discover any difference in the behavior, after tonsillectomy, of the cases which had presented tubercles and of those which had shown no such lesion. Cases presenting tubercles in the tonsil did not respond better than those in which there was no such infection. This was equally true whether the patient was suffering from pulmonary tuberculosis or from cervical adenitis. Twenty-five persons in this series gave a history of pulmonary tuberculosis; of these, 44 per cent. were found to have tuberculous tonsils and 56 per cent. were apparently free. No difference is apparent in studying these two groups. If this

1. Wood, G. B.: Significance of Tuberculous Deposits in Tonsils, J. A. M. A. **44**: 1425 (May 6) 1905.
2. Weller, C. V.: Incidence and Histopathology of Tuberculosis of the Tonsils, Arch. Int. Med. **27**: 631 (June) 1921.
3. Crowe, S. J.; Watkins, S. S., and Rotholz, A. S.: Relation of Tonsillar and Nasopharyngeal Infections to General Systemic Disorders, Bull. Johns Hopkins Hosp. **28**: 1 (Jan.) 1917.
4. Levy, Robert: The Tuberculous Tonsil, J. A. M. A. **55**: 1520 (Oct. 29) 1910.

is true, tubercles in the tonsils are neither clinically recognizable nor clinically important; and, until our knowledge of this subject is more definite, I believe that, for all practical purposes, we can dismiss this type of infection of the tonsils from our minds, as a pathologic curiosity. This does not imply any doubt in my mind as to the value of tonsillectomy in tuberculous

Table 1.—*Pulmonary Tuberculosis and Tuberculous Tonsils*

Case	Pulmonary Lesion Before Operation: Activity	Pulmonary Lesion Before Operation: Extent	Faucial Tonsils Affected	Indication for Operation	Lung Condition at Present
1	Inactive	Moderately advanced	Both	Frequent tonsillitis; fever	Improved
2	Inactive	Incipient	Both	Large tonsils; sore throat	Improved
3	Active	Advanced	Both	Frequent tonsillitis, causing relapses	Improved
4	Inactive	Moderately advanced	One	Fever unaccounted for by lung condition	Improved
5	Active	Moderately advanced	Both	Frequent colds; sore throat	Unimproved
6	Active	Advanced	Both	Tonsillitis; cryptic débris odor	Improved
7	Inactive	Incipient	Both	Hypertrophic tonsils; tuberculous otitis	Improved
8	Inactive	Incipient	One	High blood pressure	Improved
9	Active	Moderately advanced	Both	Bronchial asthma	Improved
10	Active	Moderately advanced	One	Arthritis-fever relapses	Improvement very slow
11	Active	Moderately advanced	Both	Caseous cryptic débris; irritation; cough	Cough improved; patient walking 16 blocks a day

cervical adenitis, or when indicated in properly selected cases of pulmonary tuberculosis; but I feel that the presence or absence of tubercles in the tonsils, on microscopic section, is immaterial.

Only positive cases have been reported, all suspects being eliminated. In cervical adenitis, the glands have been classed as tuberculous only when the diagnosis has been made pathologically.

In 400 consecutive cases in which operation was performed for removal of tonsils or adenoids, tubercles were found pathologically in both tonsils, ten times, in one tonsil, four times and in the adenoid, three times; or in 4.25 per cent. of all cases.

Of these seventeen cases in which tubercles were found, there was a positive history of tuberculosis in twelve, or 70.6 per cent: pulmonary tuberculosis in ten (of both tonsils in seven, of one in three); and pulmonary tuberculosis and tuberculous otitis in one (both tonsils).

Of these seventeen cases, no history or diagnosis of tuberculosis could be made in five (29.4 per cent.). Both tonsils were tuberculous in one case; one tonsil was tuberculous in one case, and the adenoid in three cases.

Tuberculosis of tonsils and adenoids, excluding cases of persons with a tuberculosis history, was found in five cases in 400, or in 1.25 per cent.

Tonsillectomies were performed in twenty-seven persons with known tuberculosis. Pulmonary tuberculosis was present in twenty-four; pulmonary tuberculosis and tuberculous otitis, in one; pulmonary tuberculosis and tuberculous cervical adenitis, in one, and tuberculous cervical adenitis, in one.

Of these twenty-seven tuberculosis was present by pathologic test in twelve, or 44.4 per cent: pulmonary tuberculosis in ten, two tonsils being affected in seven, one tonsil, in three; pulmonary tuberculosis and tuberculosis otitis, in both tonsils, in one, and tuberculous cervical adenitis, in both tonsils, in one.

Dr. Charles T. Ryder, who did the pathologic work in all of these cases states that:

"The pathologic diagnosis of tuberculosis was made only when typical tubercles, consisting of large mononuclear cells, usually accompanied by giant cells, were found in sections. Our routine is to examine one longitudinal section from the middle of each tonsil or adenoid. Very large tonsils are sometimes cut transversely. In some suspicious cases, many sections have been cut from different planes of the tonsil, but as yet tubercles have not been found in these when they were wanting in the first routine section.

"The tubercles found were single, or confluent in small groups with slight caseation at the center. They have usually been found just beneath the epithelium of surface and crypts, and deeper in the lymphoid tissue. In some instances, they have been limited to the region of one crypt with its branches, but more often they have been diffuse. Their distribution does not enable us to draw positive conclusions as to the route of infection.

"No example of ulcerative tuberculosis has been encountered in this series, nor have any large areas of caseation or tuberculous infiltration. In no case has it been possible to make the diagnosis of tuberculosis of tonsils or adenoids in the gross.

"It is not unusual in examining sections of tonsils to find small rounded areas of scar tissue which greatly resemble healed tubercles. These are always noted with interest, but the diagnosis of tuberculosis is never made unless typical tubercles of active type are found also.

"Foreign body giant cells have not been a source of confusion in this series. In a case not included in the series, a number of single giant cells were found beneath the epithelium of a gland or crypt in the adenoid. The diagnosis in this case remained in doubt. Stratified epithelium cut tangent to the end of a tonsil crypt is sometimes momentarily puzzling, but need never lead to a false positive diagnosis.

Table 2.—*Primary Tuberculosis of Tonsils and Adenoid*

Case	Age, Yrs.	General Health and Nutrition	Indication for Operation	Tonsil or Adenoid	Present Condition
1	5	Very delicate; undernourished	Tonsillitis; otitis media	Adenoid	Slight improvement
2	8	Fair; nervous and irritable	Mouth breathing; enlarged anterior cervical glands	Adenoid	Marked improvement
3	9	Good	Tonsillitis; enlarged anterior and posterior cervical glands	Adenoid	Improvement; heliotherapy employed
4	28	Fair; has heart lesion and arthritis	Arthritis; purpura	Both tonsils	Slow improvement
5	41	Fair; nervous	Headaches; tinnitus; vertigo	One tonsil	Improvement

"This work has been done in the routine of a hospital laboratory, and it has not been practical to stain and examine for tubercle bacilli, which are usually rare and hard to find in miliary lesions of lymphoid tissue.

"Nontuberculous lesions encountered in this series involve: hyperplasia of germinal areas and of tonsil or adenoid as a whole; serous and seropurulent exudation, with lymphocytes predominating; accumulation in the crypts of such exudate and of hyaline desquamated epithelium and rounded clumps of bacteria, which seem

to consist chiefly of leptothrix, though they have not been thoroughly studied; obstruction of crypts by the plica; formation of retention cysts, sometimes containing cholesterin crystals or calcified concretions; fibrosis, and development of cartilaginous areas in capsule and trabeculae; infiltration and erosion of the epithelial surface, or chronic inflammatory infiltration of deeper parts especially in areas partly fibrosed. No tonsil examined has failed to show some of these features of deviation from the ideal normal, and it is doubtful that any actual tonsil would fail to show them."

301 Ferguson Building.

THE COMMON SOURCES OF ERROR IN LUNG EXAMINATIONS

E. A. DUNCAN, M.D.
EL PASO, TEXAS

There is a very large group of persons in which a positive diagnosis of pulmonary tuberculosis has been made erroneously on insufficient and inconclusive evidence. Some of these diagnoses have been based on suggestive histories and suspicious symptoms, others on physical signs which are entirely normal, with or without supportive evidence in history or symptoms. Physicians are prone to confirm a diagnosis of tuberculosis, faulty or not, in any patient who has previously been declared tuberculous, perhaps through doubt of their own diagnostic ability, perhaps through fear of erring on the wrong side, perhaps, when former physical findings are corroborated, on the mistaken assumption that a once manifest tuberculosis must forever after leave signs evident on physical examination. In any case, these mistaken diagnoses are almost invariably supported by descriptions of nonexistent or misinterpreted physical signs.

It goes without saying that the earliest possible diagnosis is highly desirable; but, on the other hand, it is inexcusable to put the stigma of tuberculosis on any patient without clear and sufficient grounds therefor. Such a diagnosis *is* a stigma, and a very definite one. Patients with suggestive histories and symptoms may be regarded as suspects and kept under observation with such therapeutic measures as are indicated but undamaged by a premature diagnosis of tuberculosis with all that it implies as regards his future life, social status, employment, earning capacity, residence, etc.

The possibilities of damage to the individual by hasty diagnosis on uncertain grounds are immense: the possibilities of damage by reasonable delay are insignificant. The acute case will quickly make itself known beyond any doubt. A delay in diagnosis of a few weeks in the slow, chronic case will not affect the outcome.

Much of the literature of the early recognition of tuberculosis has tended to make the error of ill-advised diagnosis more common. The detection of early tuberculosis is often so described as to impress the student that it is possible only to a favored few with a superrefinement of diagnostic acumen. The effect of this has been to spur the examiner to an uncritical acceptance of symptoms, to put him in an attitude of receptiveness to vague and doubtful physical findings, sometimes to discover even gross physical signs when they do not exist. The often encountered positive diagnosis of pulmonary tuberculosis unsupported by physical signs, unsustained by roentgenograms and unconfirmed by the laboratory is to be deprecated. More frequent are mistaken diagnoses based on symptoms and histories along with deductions made from physical signs elicited in normal chests.

The existence of this considerable number of persons who bear the burden of mistaken diagnosis of tuberculosis has been recognized as a military problem by several of the greater nations engaged in the World War. In a recent study of tuberculosis epidemiology in the war, Bushnell [1] makes this impressive statement with regard to the United States Army: "The total number of admissions to tuberculosis hospitals in the United States up to Jan. 1, 1920, is 18,713. In these the diagnosis was not confirmed in 4,305." The problem is as much a civil as a military one.

Accurate and critical physical examination is a primary essential in the diagnosis of pulmonary tuberculosis. It is not my aim in this paper to discuss what should constitute the standards of diagnosis or the possible mistakes due to sins of omission on the part of the examiner. My purpose here is to consider the mistakes due mainly to misinterpretation of physical signs in the normal chest.

FREMITUS

The statement of Fishberg [2] that palpation of vocal fremitus is of little diagnostic value in any stage of phthisis is undoubtedly correct, gross changes within the chest, pneumonia, pleural effusion and pneumothorax, of course, excepted. Fremitus must be mentioned here, however, since many examiners seem to lay some weight on it. Textbooks generally state that fremitus is normally increased over the right upper lobe; it is usually increased throughout the right lung. The intensity of fremitus is so variable that, unless greatly increased or absent in a given area, it means but little. This is especially true in regard to increase over the area of normal accentuation.

PERCUSSION

The dissimilarity in the anatomic relations of the pulmonary apexes described by Fetterolf and Norris [3] accounts for the difference in the character of the percussion note on the two sides. The shorter and higher pitched note of the right apex is the principal source of error in percussion signs. That this is a normal finding cannot be too strongly emphasized. Kroenig's isthmus may be narrowed, or there may be a definite apical dulness on one or both sides without alteration in the structure of the underlying lung. Minute changes in the percussion note in symmetrical areas, of the variety sometimes described as "slight possible," are misleading and of no diagnostic value. The personal experience of Cornet [4] is significant. "Two very renowned and experienced physicians exhibited the same patient on the same day, the one in the morning, for dulness of the right apex, the other in the afternoon, for dulness over the left apex!" Contraction of the sternomastoid muscle and tension on the tissues of the neck when the patient turns his head toward the opposite side, a common trick, produces a deceptive dulness

1. Bushnell, G. E.: Tuberculosis Epidemiology in the World War, Mil. Surgeon. **51**: 5 (Nov.) 1922.
2. Fishberg, Maurice: Pulmonary Tuberculosis, Ed. 3, Philadelphia, Lea and Febiger, 1922, p. 312.
3. Fetterolf, G., and Norris, G. W.: The Anatomical Explanation of the Relatively Less Resonant, Higher Pitched, Vesiculotympanitic Percussion Note Normally Found at the Right Pulmonary Apex, Am. J. M. Sc. **143**: 5 (May) 1912.
4. Cornet, G.: Tuberculosis, etc., in Nothnagel's Practice, American edition, Philadelphia, W. B. Saunders Company, 1905, p. 425.

above the clavicles. It may be stated that impairment of resonance over an apex without retraction, without alteration in the breath sounds or without râles cannot justify a diagnosis of increased pulmonary density.

AUSCULTATION

There is, unfortunately, no common terminology nor a fast standard in use for the description of breath sounds. What one examiner regards as bronchial breathing is to anoher bronchovesicular. For the purposes of this paper, bronchial breathing is defined as that type of respiratory sound in which inspiration is roughened and expiration prolonged and equal or higher in pitch than inspiration. Bronchovesicular breathing is defined as the type in which the prolonged expiration is lower in pitch than inspiration. These terms are satisfactory for the description of abnormal breath sounds, and leave little margin for error. They may be modified as necessary by qualifying adjectives: distant, diminished, cavernous, amphoric, etc. Such terms as "altered," "modified" and "impure" are hardly descriptive when applied to breath sounds.

There are two main sources of mistake in the interpretation of breath sounds: (1) the normally present bronchovesicular breathing on the right side down to the second rib and third dorsal spine; (2) noisy respiration. The bronchovesicular breathing of the interscapular area does not seem to give rise to confusion. It is remarkable how often a report of examination reads about as follows: "Fremitus increased over right upper lobe. Shorter percussion note to second rib and spine of scapula. Roughened inspiration and prolonged expiration to second rib and spine of scapula." From these signs a diagnosis is made of fibrosis of the right upper lobe. The findings are those of a normal chest.

Auscultatory signs in the lungs cannot be intelligently interpreted unless the examiner first sees to it that the patient is breathing properly. When the average individual is directed to breathe, the mere focusing of his attention on his respiration almost always results in noisy respiratory sounds which are impossible of evaluation. Forcible noisy respiration produces bronchovesicular breathing throughout the chest. Over the area of normal intensification, the right upper lobe, and even throughout thin-walled chests, the sounds may be definitely bronchial in character. As in the case of dulness in a supraclavicular space, a similar area of bronchial breathing, unaccompanied by other physical signs, does not justify a diagnosis of increased density of the subjacent lung.

RÂLES

The terms in common use for the description of râles are variously employed by different physicians. Confusion is most evident in the case of moist and dry râles; that is, what one examiner describes as moist are to another dry. An excellent classification and one which does not permit variation in description is that of Seiffert and Müller.[5] This schema classifies râles as moist and dry. Moist râles are discontinuous or interrupted sounds, a series of clicks. A dry râle is a continuous sound. It is a sound produced by stenosis, whether by partial obstruction by mucus or by turgescence of the bronchial mucosa. Under this head fall what are described as squeaking, piping, sibilant and sonorous râles. Moist râles are subdivided into crepitant, fine, medium and large; dry râles into fine, medium and large. The terms consonating and metallic are used as required. This classification seems sufficient, and the introduction of more descriptive terms is of doubtful advantage and productive of confusion.

No lung examination is complete without auscultation after cough, a fact recognized by the patients themselves. Turban described a consumptive who had been the subject of many examinations and who judged the ability of his examiner by whether or not he was required to breathe and cough during the examination. This patient now has many followers, and they are on safe ground. But latent, or, better, provoked râles, may not be produced by cough if the procedure is not correctly carried out, especially if few in number and in a limited area. The cough must occur at the end of expiration. This will be apparent on consideration of what, I believe, is the correct explanation of the somewhat disputed mechanism of the production of provoked râles. The explanation of Bray[6] is not adequate: the older idea, somewhat modified, of the separation of moist surfaces and breaking of fluid films is preferable. Bray believes that the râles occur with cough which, by the sudden increase of pressure first separates the walls of alveoli and bronchioles and then, their patency established, puts into vibration the fluid therein. Provoked râles do often, but by no means always, occur at the end of the expulsive effort as the lung recoils, but they also occur in large numbers at the beginning of the following inspiration.

The movements of and the pressure conditions within the lung as judged by the fluctuations of the diaphragm may be studied under the fluoroscope. With cough, as the glottis is opened, the diaphragm ascends sharply, and as suddenly descends as the abdominal pressure is released. The recoil of the lung with descent of the diaphragm is timed with the end of the expulsive effort of the cough, but while air is still being expelled from the mouth. The tracheobronchial air column is evidently under sufficient pressure to pass in both directions, both out of the mouth and downward into collapsed bronchioles when the lung is permitted to expand on release of the pressure within the abdomen. It is with the recoil of the lung that the first provoked râles occur: the later ones are definitely inspiratory. The production of fine moist, that is, bronchiolar râles in this way is best explained by the accompanying diagram, which represents a condition often seen in large sections of lung in inflammatory diseases when the knife has traversed a bronchiole for some distance in its long axis.[7] It is manifest from the foregoing that, unless bronchioles are well flattened by expiration and cough fluid, particles may not completely occlude the lumen, and no râles will be produced when the bronchiole again widens.

Of the adventitious sounds which may simulate râles, only passing mention is called for by muscle sounds, scapular grating, noises produced by swallowing, or crepitations due to insecure application of the stethoscope or its contact with hair. None of these should prove a source of error by confusion with râles. The sounds which notably simulate râles are those of cartilaginous origin and marginal sounds. The former, which Ewart[8] has termed "audible motor crackles,"

5. Seiffert and Müller: Taschenbuch der medizinisch-klinischen Diagnostik, Ed. 15, Wiesbaden, J. F. Bergman, 1912, p. 31.

6. Bray, H. A.: The Latent Râle in the Diagnosis of Incipient Tuberculosis, J. A. M. A. 66: 11 (March 11) 1916.

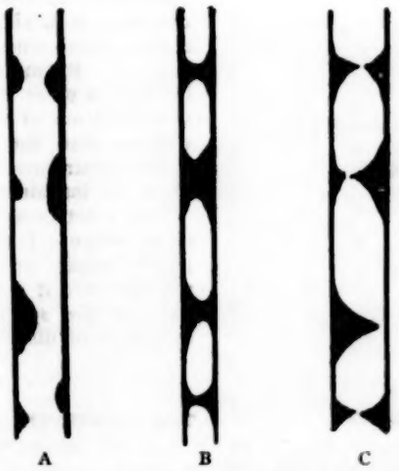
7. A photomicrograph illustrating this condition may be found in Edens, E.: Lehrbuch der Percussion und Auskultation, Berlin, Julius Springer, 1920, p. 152.

8. Ewart, William: On Perez's Sign, Brit. M. J. 1: 2675 (April 6) 1912.

are encountered with great frequency. The statistics of King[9] to their occurrence, in 4 per cent. of patients examined, are very low. My own impressions are more in accord with the studies of Hawes,[10] who found them in 22 per cent. of persons observed.

Joint sounds have one common characteristic, namely, that they rarely occur at the end of cough but later in the inspiratory phase. Over the front of the chest they originate in the sternoclavicular joints, the junctions of the pieces of the sternum, the sternochondral and costochondral junctions. They are heard above the clavicle, and, lower down, mainly between the sternum and nipple line. It is not a difficult matter to differentiate them from râles. They have a more marked snapping, clicking quality than râles, they are conducted along the bony structures, they may be followed up to their point of origin, where they become loud and consonating and they may be made to disappear by securing partial immobility of the structures in which they originate if the patient is made to draw his shoulders forward or backward and if they are forcibly held in that position during auscultation.

The questions for the examiner to decide in following up these clicks to their point of production are whether they occur at the same point in inspiration, whether their number continues the same, and whether they increase in intensity to their place of origin. I have found no mention in the literature of joint sounds heard posteriorly. In the back, crepitations are heard near the spine down to the lower interscapular area. These sounds originate in the intervertebral or costovertebral articulations. At a little distance from the spine, muffled by conduction through soft tissues, they may exquisitely simulate fine, moist râles except in the general characteristic mentioned above, that they occur later in inspiration. These vertebral noises are instantly recognized as such if the stethoscope is applied to the adjacent spine.



A, bronchiole with fluid masses clinging to walls; no râles present; *B*, bronchiole narrowed by expiration and cough; fluid masses now completely obstruct lumen; *C*, bronchiole widened with the elastic recoil of the lung or on inspiration; the clicks occur as the fluid films break or are detached from the wall by the air current.

Though clicking noises at the bases of the lungs have been described in all sorts of intrathoracic disease, most writers on physical diagnosis have learned to pay little attention to them, usually ascribing them to marginal atalectasis. Bushnell[11] has shown that these sounds are due to the separation of the moist surfaces of the diaphragmatic and mural pleura as the diaphragm peels from the chest wall with the descent of the lung margin. Thus, they accompany the descending sulcus of Litten's phenomenon. Marginal sounds are still mistaken for râles with some frequency, and a diagnosis of tuberculosis thereby made by the unwary, in spite of the fact that their location, without other findings, should not suggest tuberculosis. They do, in fact, markedly simulate moist râles, and, in some vigorous breathers, occur in showers and with a consonating quality.

The differentiation of râles and marginal sounds is readily made. The patient is directed forcibly to exhale and cough, but without following the cough by inspiration. With the breath now held in forced expiration, the lung border is rapidly determined by percussion and is marked. It will be found on subsequent cough and inspiration that marginal sounds are not found above the marked line, and that, from above downward, they are heard at a progressively later stage of inspiration. Furthermore, they do not occur with the cough but with the following inspiration. The same sounds are occasionally heard along the left border of the heart with the downward and inward movement of the lingula on inspiration.

NONTUBERCULOUS INFECTIONS

Mention must be made of the chronic nontuberculous infections occurring at the base of one or both lungs, usually posteriorly, which are so often erroneously assumed to be tuberculous. They are a frequent cause of chronic cough and mucopurulent expectoration, sometimes blood streaked. Rarely they may be the source of a profuse hemoptysis, perhaps when complicated with bronchiectasis or when syphilitic in origin. Impairment of the patient's general health is, as a rule, trifling. On physical examination, these infections present the signs of a more or less extensive bronchitis with or without evidence of insufficient ventilation of that portion of the lung, or of some increase in pulmonary density. In the absence of signs of involvement of the upper lobes and without sputum containing tubercle bacilli, a diagnosis of tuberculosis in these cases cannot be made.

SUMMARY

1. The considerable number of erroneous diagnoses of pulmonary tuberculosis are almost always based on or supported by descriptions of nonexistent or misinterpreted physical signs.

2. Any single sign of increased pulmonary density, especially at the apexes, unaccompanied by other evidence, must be regarded as insufficient and conclusions therefrom withheld. This applies equally to alterations in fremitus, percussion changes, and abnormal breath sounds.

3. The misleading differences in the physical signs of the two sides must be kept in mind.

4. Vigilance on the part of the examiner to recognize factitious accentuations of breath sounds, extrapulmonary noises of cartilaginous origin and marginal sounds is essential to correct diagnosis.

5. The elicitation of provoked râles requires a considerable reduction of pulmonary volume by expiration followed by cough.

6. Basal bronchitis without upper lobe involvement must be proved tuberculous by the laboratory before such diagnosis can be made.

610 Martin Building.

9. King, J. T., Jr.: Auscultation of the Pulmonary Apices in Young Men, Mil. Surgeon **42**: 1 (Jan.) 1918; abstr. J. A. M. A. **70**: 7 (Feb. 16) 1918.

10. Hawes, J. B.: Extrapulmonary and Other Sounds Which May Lead to Errors in the Diagnosis of Pulmonary Tuberculosis, Boston M. & S. J. **170**: 25 (June 18) 1914.

11. Bushnell, G. E.: Some Extrapulmonary Sounds Which Simulate Râles, M. Rec. **81**: 3 (Jan. 20) 1912; Marginal Sounds in the Diagnosis of Pulmonary Tuberculosis, ibid. **82**: 55 (Dec. 21) 1912.

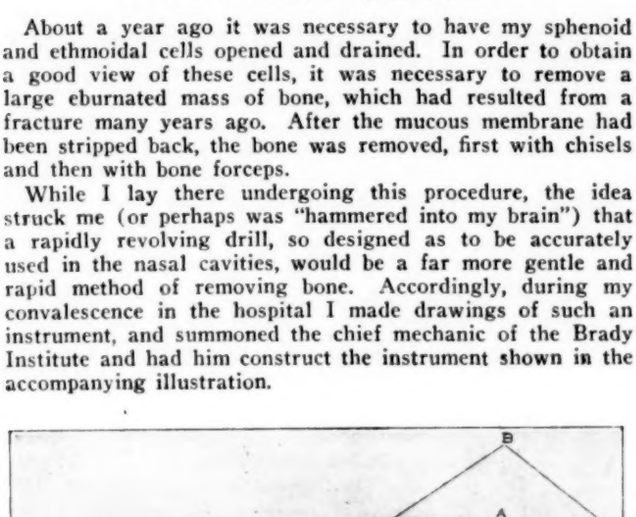
Clinical Notes, Suggestions, and New Instruments

NASAL DRILL FOR REMOVAL OF SEPTAL SPUR *

HUGH H. YOUNG, M.D., BALTIMORE

About a year ago it was necessary to have my sphenoid and ethmoidal cells opened and drained. In order to obtain a good view of these cells, it was necessary to remove a large eburnated mass of bone, which had resulted from a fracture many years ago. After the mucous membrane had been stripped back, the bone was removed, first with chisels and then with bone forceps.

While I lay there undergoing this procedure, the idea struck me (or perhaps was "hammered into my brain") that a rapidly revolving drill, so designed as to be accurately used in the nasal cavities, would be a far more gentle and rapid method of removing bone. Accordingly, during my convalescence in the hospital I made drawings of such an instrument, and summoned the chief mechanic of the Brady Institute and had him construct the instrument shown in the accompanying illustration.



Nasal drill for removal of septal spur: *A*, outer tube; *B*, drill; *C*, set-screw to regulate the exact penetration of the drill; *D*, trigger that advances the drill point; *E*, flexible cable; *F*, whalebone bougie that is first introduced through the natural orifice into the sphenoidal sinus; *G*, tube that replaces tube *A* when sphenoid is to be opened.

As will be seen here, it consists principally of a drill about one-fourth inch in diameter, which revolves by means of a flexible cord connected with an electric motor. This drill revolves within a tube, by means of which it is connected with the handle, and a trigger action, which carries it back and forth at will. The distal end of the tubular shaft contains four small, sharp, toothlike projections, which are intended to penetrate into the bone at the site of attack and hold the instrument steady while the drilling is in progress. The action of the drill can be regulated by means of a set-screw, so that a depth of boring, varying from 0 to one-half inch, can be secured. It is also possible to have drills of different sizes to connect with the same instrument, as they are easily detached from the handle and shaft.

Experiments with bones outside the body showed that the drill would penetrate even very hard bones with great speed, and that the work could be accurately done and the desired depth assured.

The trigger action is arranged so as to allow the operator to hold the instrument with a firm grip. The thumb of the operating hand is provided with a special receptacle so as to add to the accuracy of the manipulation.

With the idea of utilizing the same instrument for opening the sphenoid, a second tubular shaft has been provided. This tube carries a small collar and eyelet, to be threaded on a whalebone filiform, which has previously been inserted into the sphenoidal foramen, and thus lead the instrument to the exact spot at which the opening is to be made. Here, again, the set-screw makes it possible to determine exactly the depth of boring, and accuracy is thus assured.

I wish to apologize for thus seeming to invade another specialty; but, as Dr. Crowe has been good enough to use this instrument in several cases and pronounces it of value, and as he also refuses to report it himself, I am prompted to give this brief description.

NOTE BY DR. S. J. CROWE, BALTIMORE

The instrument devised by Dr. Young is very ingenious, and greatly facilitates the removal of the large septal spurs and deflections arising from the *lower* portion of the septum. The bone in this location is often very hard, and its removal necessitates the use of a hammer and chisel.

I have used this revolving drill in every suitable case during the last year, and always with success. The mucous membrane overlying the spur is elevated, and the drill is placed on the bone. By firm pressure, the small, sharp projections on the end of the tube will penetrate the bone sufficiently to hold the drill in place after the power is turned on. It is possible to thus bore two or three parallel channels through a spur, after which the intervening bone can be easily and painlessly removed, with ordinary nasal rongeurs.

It is rarely necessary to elevate the mucous membrane on both sides of the spur, and often it is not necessary to cocainize both sides of the nose. The drill is operated by a foot switch, and is started only after it has been placed in position. By means of the small, sharp projections, it can be held in place with accuracy. The rapidly revolving drill is pushed out of the tube by pressure on the trigger, and it will penetrate the hardest bone without vibration or pain.

This instrument is well balanced and small enough to allow its introduction into the nose under direct vision.

I have not used this instrument for opening the sphenoidal sinus, because I am afraid that fragments of bone or other débris might be introduced into the sinus cavity; but mechanically it is possible with this drill safely and rapidly to open the sphenoidal sinuses or the antrums with the minimum of discomfort and time.

* From the James Buchanan Brady Urological Institute, Johns Hopkins Hospital.

THE DETERMINATION OF PHENOLSULPHONEPHTHALEIN EXCRETION IN THE PRESENCE OF HEMATURIA *

EDWARD G. WATERS, PH.B., M.D., BROOKLYN

The importance of the phenolsulphonephthalein test for kidney function, and its relative simplicity of performance, are now well appreciated by all whose work includes diagnosis of the various nephropathies. More recent work[1] indicating that lowered excretion of phenolsulphonephthalein is practically always the first evidence of renal damage, functional or organic, only enhances its value to the clinician. It is obvious, therefore, that any factor which may inhibit successful use of the test in the presence of certain of the various nephropathies offers a serious handicap. One of the most frequent and objectionable hindrances to the satisfactory use of the dye is the presence of blood in the urine. Another is a urine of high color.[2]

Burwell and Jones[3] recently offered a method for rendering the urine free from blood and bile. Previously there had been no successful method for removing the blood pigment without altering the phenolsulphonephthalein reading, or in some other way preventing accurate determinations.

* From the Brooklyn Hospital.

1. Tardo, A.: The Phenolsulphonephthalein Test in Urinary Surgery, J. d'urol. **13**: 167 (March) 1922; Phenolsulphonephthalein in Urinary Surgery, ibid. **12**: 393 (Dec.) 1921. MacNider, W. de B.: Study of Renal Function and the Associated Disturbance in the Acid Base Equilibrium of the Blood in Certain Experimental and Naturally Acquired Nephropathies, with Citation of Previous Papers, Arch. Int. Med. **26**: 1 (July) 1920. Lichty, J., and Bradshaw, W.: The Clinical Interpretation of the Phthalein Test and Ambard Coefficient in Certain Disturbances of Kidney Function, Pennsylvania M. J. **25**: 838 (Sept.) 1922. Rowntree, L. G.: Renal Function Tests, Northwest Med. **21**: 220 (July) 1922.
2. Christian, H. A.: Oxford Medicine **3**: 637.
3. Burwell, C. S., and Jones, C. M.: The Removal of Bile and Blood from the Urine in Performing the Phenolsulphonephthalein Test of Kidney Function, J. A. M. A. **77**: 462 (Aug. 6) 1921.

The method suggested by Rowntree and Geraghty,[4] employing lead acetate, while clearing the urine of bile, did not remove hemoglobin from solution.

The desirability of simple methods for clearing urine of blood is apparent. The method here described is of value because it clears the specimen of the last trace of blood-coloring matter. It leaves a clear, benzidin-negative specimen, which shows no absorption bands for hemoglobin in the spectroscope, and in which the phenolsulphonephthalein percentage is not altered.

The method rests on the action of magnesium chlorid on an alkaline solution of hemoglobin.[5] When magnesium chlorid is added to an alkaline solution of hemoglobin, the hematin split off is carried down out of solution with the precipitate of magnesium hydroxid formed, and the filtered solution is clear. The necessary reagents are two: (1) a concentrated solution of sodium hydroxid, and (2) a half-saturated solution of magnesium chlorid. The latter is conveniently made by dissolving magnesium chlorid crystals in water, or by dissolving magnesium hydroxid in hydrochloric acid.

The steps in the procedure to determine the phenolsulphonephthalein output in cases presenting hematuria, then, are as follows:

One cubic centimeter (60 mg.) of phenolsulphonephthalein solution is injected into the lumbar muscles or into the deltoid, in the usual manner, and the time is noted. Ten minutes is allowed for absorption and distribution, the bladder is emptied, and the urine is collected at the end of one hour and of two hours. The excretion of the first hour is then put into a beaker, and from 10 to 15 c.c. of concentrated sodium hydroxid solution is added, and the solution heated. Alkaline oxyhemoglobin forms, and hematin is split off, giving the solution a dark brown color, if the amount of blood present is appreciable. When the solution in the beaker is warm, 10 c.c. of magnesium chlorid solution is added, the mixture being rapidly stirred, and the contents of the beaker are heated almost to boiling. The contents of the beaker are then poured into a 1,000 c.c. measuring vessel, and diluted up to the mark with tap water. A sufficient amount is then filtered and read against a known standard, or with the convenient standards of the Hynson-Westcott set. As no unusual dilutions have been made, the reading is direct, and the percentage read corresponds to the percentage of phenolsulphonephthalein in the specimen cleared.

It will be noted that the filtrate is clear of bacterial clouding, sediments, proteins and hematin, and that the amount and color of the dye are unaltered. As an added refinement, we divide the specimen, retaining half should the portion used be destroyed in any way. Obviously, when half the specimen is used, the dilution is only to 500 c.c.

Despite the evident simplicity of the method described, there are some possible sources of error. If an insufficient amount of sodium hydroxid is used, the filtrate is brown, owing to the hematin still in solution. If the solution is tested with litmus paper after the magnesium chlorid has been added and still found alkaline, no difficulty of this sort will be encountered. Of course, when the solution is not alkaline, the color of the dye will not appear. It will seldom be necessary to add more than 10 c.c. of the magnesium chlorid solution. If very large amounts of blood are present, it will be necessary to increase the amounts of the reagents used; but the quantities given above have been sufficient in practically all of the hospital cases presenting hematuria.

Extensive studies made to determine the effect of the "clearing" method on the amount of phenolsulphonephthalein present have shown conclusively that there is no appreciable loss of the dye. The following mixtures were treated with the methods described above:

1. Normal urine plus varying percentages of blood gave clear urine.

2. Distilled water plus varying percentages of blood gave clear water.

3. Normal urine plus varying percentages of blood and phenolsulphonephthalein gave clear solutions showing the dye present in the same percentages as in controls.

4. Distilled water treated as was the urine in the preceding paragraph gave similar results.

5. Normal urine and distilled water, containing the dye in varying percentages, showed no loss or change in color of the dye.

In addition to the foregoing artificial mixtures, a large series of tests was conducted on persons without hematuria. The specimens were divided, one portion was used as a control, and to the other was added blood, the amount varying to make the percentage of blood in the specimen range from 0.1 to 30 per cent. in the cases tried. The readings checked accurately. In those instances in which a low excretion was expected, a lower dilution was made, the "concentration" of the dye thus giving more accurate and easily read results.

SUMMARY

This simple modified test is of value because it is quickly and easily done with simple reagents, employs no dilutions requiring complicated figuring, and is of proved accuracy and efficiency. It has been applied clinically in cases in which there was persistent hematuria, and has been found satisfactory.

De Kalb Avenue and Raymond Street.

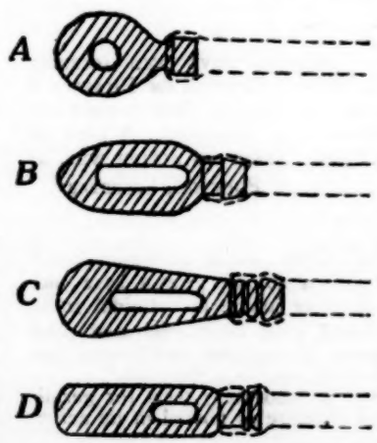
4. Rowntree, L. G., and Geraghty, J. T.: An Experimental and Clinical Study of the Functional Activity of the Kidneys by Means of Phenolsulphonephthalein, J. Pharmacol. & Exper. Therap. 1: 579-661, 1910.

5. Mathews: Physiological Chemistry, 1916, p. 504.

A NEW TIP FOR GASTRODUODENAL TUBES*

EDWARD HOLLANDER, M.D., NEW YORK

The tip here illustrated is constructed to fulfil what I believe are the theoretical mechanical requirements of an ideal tip for gastric and duodenal tubes. In practice, because of its narrow diameter combined with proper weight, it has been found superior to the tips that are in popular use. Its construction is based on the following principles of gastroduodenal intubation and drainage:



Types of properly fenestrated gastroduodenal tips: *A*, ball-shaped tip (Palefski); *B*, olive-shaped tip (Rehfuss); *C*, pear-shaped tip (Lyon); *D*, author's narrow, cylindric tip.

1. The diameter of the tip should be as small as possible. This is determined by the caliber of the rubber tubing. No. 8 French tubing is considered most practicable for gastroduodenal work. When such tubing is stretched over the shank of a duodenal tip to secure the latter in place, its outer diameter becomes 6 mm., which should be the diameter of the tip. The advantages of a narrow tip are obvious. It can pass into the duodenum through moderate degrees of pylorospasm more readily than a wider tip. It can be swallowed and withdrawn more easily. Especially in withdrawing the tube, in many patients, the average tip is caught tightly at the level of the glottis, causing anxiety to both patient and physician. This has never occurred with the narrow tip.

2. The weight of the tip should be sufficient to carry the tube down the esophagus and maintain the tip in a dependent position in the stomach. Making its distal half a solid lead-filled shell brings its weight up to 4.5 gm. (70 grains), which is sufficient to fulfil these conditions. In the fasting state, the walls of the antrum are collapsed, obliterating that portion of the gastric cavity. Therefore, in duodenal intuba-

* From the Medical Department, Mount Sinai Hospital.

tion, while the weight of the tip should keep it in a dependent position, its progress through the pylorus will depend chiefly on peristaltic action. Entrance of the tip into the duodenum is facilitated by three steps: (*a*) The placing of the patient in the right Sims position brings the duodenum to a position lower than that of the stomach; (*b*) the drinking of half a glass of water, after the tip has passed the cardia, stimulates the peristalsis of the stomach; (*c*) swallowing the last ten inches of the tube slowly over a period of half an hour allows the tip to advance slowly with the peristalsis without coiling of the tube in the stomach.

3. The lumen of the tip and the width of the fenestrations should equal the bore of the rubber tubing.

4. The drainage chamber of the tip should be ample to provide for continuous drainage through the tube. This is accomplished by making four elongated fenestrations equal to one-third the length of the tip.

5. The tip should be held securely by the rubber tubing without being fastened with thread. If two sharp elevated rings are placed at the proximal end of the shank, the tip is "hugged" tightly and can be removed only by the use of much greater force than that used in withdrawing the tube from the duodenum.

A point worth emphasizing in duodenal intubation is the importance of the proper quality of the rubber tubing. A tube that is too soft, or that is aged and inelastic tends to coil and does not follow the curvature of the stomach as it is slowly introduced. As a simple and practical test for the proper quality of the tubing, I have found that when any two inches of its length is turned end to end it should not "kink" in the middle but should maintain a uniform diameter throughout the loop.

71 East Ninety-Sixth Street.

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION. W. A. PUCKNER, SECRETARY.

NEO-SILVOL.—Colloidal silver iodide compound.—A compound of silver iodide with a soluble gelatin base containing 18 to 22 per cent. of silver iodide in colloidal form.

Actions and Uses.—Neo-Silvol, even in concentrated solutions, causes neither irritation of mucous membranes nor coagulation of albumin. It does not stain the skin.

It is claimed that neo-silvol in laboratory tests for germicidal value has been found as effective as phenol in its action on bacteria.

Neo-silvol is intended for the prophylaxis against, and treatment of infections of accessible mucous membranes and is claimed to be indicated in infections of the genito-urinary tract and of the eye, ear, nose and throat.

Dosage.—In the treatment of acute inflammations of the mucous membranes solutions of neo-silvol as strong as 50 per cent. may be used. In inflammatory infections of the ear, nose and throat, 5 to 40 per cent. solutions are used; for irrigating sinuses 2 to 5 per cent.; for inflammatory conditions of the eye and conjunctival infections in strength of 10 to 40 per cent.; in acute anterior urethritis, as an abortive measure, 20 per cent.; for posterior urethritis or in the routine treatment of anterior urethritis, 10 per cent.; in the genito-urinary tract of the female, from 10 to 50 per cent.

Solutions of neo-silvol are prepared by adding the substance to the required amount of water and agitating the mixture until solution occurs.

Manufactured by Parke, Davis and Co., Detroit, Mich. U. S. patent and trademark applied for.

Capsules Neo-silvol, 6 grains.

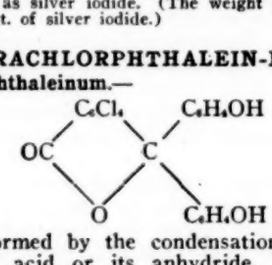
Neo-silvol is prepared by heating freshly precipitated silver oxide with gelatin (which has been previously dissolved in a dilute alkaline solution) until the silver oxide has been reduced to metallic silver in a colloidal state of subdivision. The solution is treated with iodine, which combines with the silver. The liquid is then evaporated to dryness in vacuo. The finished product contains from 1 to 3 per cent. of combined iodine in excess of that required for combination with the silver.

Neo-silvol occurs as pale yellow granules. In concentration up to 50 per cent. neo-silvol forms with water almost colorless, milky or opalescent solutions (colloidal suspensions). Neo-silvol is insoluble in fixed oils, but slowly soluble in glycerine. Solutions of neo-silvol are not precipitated in the cold by strong acids or sodium chloride.

If a solution of neo-silvol is treated with a solution of potassium hydroxide no precipitate of silver iodide is formed; if this solution is boiled for a few minutes, it darkens gradually, but no precipitate is formed unless it is allowed to stand for some time. If a solution of neo-silvol is treated with dilute hydrochloric acid silver iodide is not precipitated; if this mixture is now boiled, the silver iodide is gradually precipitated. Dilute solutions of neo-silvol do not discolor in sunlight (absence of silver chloride and silver bromide).

Transfer about 1 Gm. of neo-silvol, accurately weighed to an 8 ounce Erlenmeyer flask containing 100 Cc. water and heat on steam bath until "solution" is effected. Add. 5 Cc. of hydrochloric acid and boil gently over a flame for ten or fifteen minutes; cool; when sufficiently cool to handle, filter through a tared Gooch crucible containing a fairly thick pad of asbestos. Wash thoroughly with water acidulated with hydrochloric acid (0.3 per cent. hydrochloric acid). Dry at 100 C. and weigh as silver iodide. (The weight found is equivalent to 18 to 22 per cent. of silver iodide.)

PHENOLTETRACHLORPHTHALEIN-H. W. & D.—Phenoltetrachlorphthaleinum.—



A dibasic dye formed by the condensation of phenol and tetrachlorphthalic acid or its anhydride. It differs from phenolphthalein in that four hydrogen atoms have been replaced by four chlorine atoms.

Actions and Uses.—Phenoltetrachlorphthalein has been used for the determination of the functional activity of the liver. It can be used, *in form of the sodium salt,* intravenously; it cannot be given subcutaneously or intramuscularly. It has been proposed that the excretion can be determined by any one of these methods:

1. The excretion of the drug in the stool: Rowntree, Hurwitz and Bloomfield (*Bull. Johns Hopkins Hosp.* **24**:327, 1913); Whipple, Puchtol and Clark (*Bull. Johns Hopkins Hosp.* **24**:343, 1913); Rowntree, Marshall and Chesney (*Proc. Am. A. Phys. & Surg.,* 1914; THE JOURNAL, Oct. 31, 1914. p. 1533).

2. The excretion of the drug in the duodenum by means of a duodenal tube: Aaron, Beck and Schneider (THE JOURNAL, Nov. 19, 1921, p. 1631).

3. Its disappearance from the blood stream: S. M. Rosenthal (*J. Pharmacol. & Exper. Therap.* **19**:385 [June] 1922); H. H. Rosenfield and E. F. Schneiders (THE JOURNAL, March 17, 1923, p. 743).

Dosage.—From 0.05 to 0.4 Gm. administered in the form of the disodium salt. The solution must not be exposed unduly long, as the salt is sensitive to the action of the carbon dioxide of the atmosphere.

Manufactured by Hynson, Westcott & Dunning, Baltimore, Maryland. No U. S. patent or trademark.

Ampules Phenoltetraphlorphthalein-H. W. & D. Each ampule contains more than 2 Cc. of a solution of disodium phenoltetrachlorphthalein, each cubic centimeter representing 0.05 Gm. of phenoltetrachlorphthalein-H. W. & D.

Phenoltetrachlorphthalein-H. W. & D. is a pink powder; odorless; permanent in the air. It is practically insoluble in water; very soluble in acetone; soluble in alcohol, ether and glacial acetic acid; slightly soluble in chloroform, benzene and carbon disulphide. It dissolves in solutions of the alkalies and carbonates to form solutions which are deep purple when concentrated, but which change to violet-red on dilution, and in very dilute solutions assume a bluish tint (*distinction from phenolphthalein*).

Phenoltetrachlorphthalein does not melt when heated to 300 C. It does not respond to the U. S. P. test for heavy metals as described under phenolphthalein.

Dry about 1 Gm. of phenoltetrachlorphthalein-H. W. and D., accurately weighed, to constant weight at 115 C. The loss is not more than 0.5 per cent. To about 5 Gm. of the substance, accurately weighed, add 25 Cc. of normal sodium hydroxide solution, heat to about 70 C. and stir. Dilute with warm water to about 75 Cc., filter through a tared Gooch crucible, dry to constant weight at 115 C. and weigh. The weight of the insoluble matter (*tetrachlorfluorane*) does not exceed 0.2 per cent. Incinerate about 2 Gm. of the substance, accurately weighed. The ash does not exceed 0.15 per cent.

Hospital a Health Exponent.—The hospital as an exponent of health should provide for its entire personnel sanitary surroundings, adequate and suitable diet, and a properly proportioned daily life from the standpoint of occupation, intellectual development, recreation and rest.—A. W. Goodrich, *Hospital Social Service* **7**:173 (March) 1923.

STATE BOARD STATISTICS FOR 1922

ANNUAL PRESENTATION BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS OF THE AMERICAN MEDICAL ASSOCIATION OF RESULTS OF STATE BOARD EXAMINATIONS

On pages 1220 to 1227 are three tables, A, B and C, giving in detail the results of the various state medical license examinations held during 1922. All state licensing boards sent in reports, and the figures have been carefully verified.

Tables A and B, when read from left to right, show for each medical college named (*a*) the number of graduates appearing for examination in each state, (*b*) whether they passed or failed, (*c*) the total number examined during the year, (*d*) the number who passed, (*e*) the number who failed, (*f*) the percentage of failures, and (*g*) the number of states in which graduates of that school appeared for examination. Read from above downward, they give the results by states, showing (*h*) the number registered and rejected from each college, (*i*) the total numbers examined, registered and rejected, and (*j*) the percentage of rejections. The majority of graduates take the license examination in the state in which the college is located, as shown by the dark diagonal zone of figures passing from the upper left to the lower right corner of each table. These tables are worthy of careful study, since important deductions are possible. The marginal numbers will enable one to follow readily the line for any college.

Graduates of All Years Examined in 1922

Table A shows the results for all candidates who took examinations in 1922, regardless of the years in which they graduated. This shows that altogether 3,993 candidates were examined last year, as compared with 4,807 in 1921, 4,787 in 1920, 4,736 in 1919, and 3,637 in 1918. This year shows a decrease of 814 since last year, but an increase of 356 over 1918. Since 1906 and until 1919 there was a steady decrease in the totals examined owing chiefly to (*a*) the increasing number registered through reciprocity, and (*b*) the general diminution in the number of medical colleges, students and graduates. The marked decrease in 1918 was due to the enlistments for military medical service, while the decrease in 1922 was due to the small number, 2,529—the war class—who graduated in that year. Of those examined in 1922, 12.3 per cent. failed, as compared with 12.4 in 1921, 15.3 in 1920, 14.3 in 1919, and 13.3 in 1918.

There were 70 medical colleges in the United States granting degrees in 1922 which had graduates examined, as compared with 75 in 1921, 78 in 1920, 79 in 1919, and 80 in 1918. There has been a decrease of 83 since 1905, when graduates from 153 medical colleges were examined. The statistics covering schools which have ceased to exist are included in the line for "miscellaneous colleges."

Graduates of Canadian medical schools were examined in 22 states. The largest number, 37, were examined in New York, the next largest number being 7 examined in Michigan. The figures for each college are given separately in order to show the number of candidates coming from each, and to show the successes of their graduates at the examinations. Altogether, 82 candidates from Canadian colleges were examined, of whom 9, or 11.0 per cent., failed.

Foreign graduates were examined in 30 states, the total examined being 186, and of this number 76, or 40.9 per cent., failed. In 1918 45, in 1919 67, in 1920 86, and in 1921 178 foreign graduates were examined. There has been a steady increase of foreigners licensed since 1918. The largest number of foreigners examined in any state in 1922 was 63 in New York, where 29, or 46 per cent., failed.

Caution in Forming Conclusions

In making comparisons on the basis of these statistics, the reader must keep in mind (*a*) the number of graduates examined; (*b*) the number of states in which a school's graduates have been examined; (*c*) the character of the board making the examination and the methods employed. Some boards refuse to examine graduates of inferior medical colleges, while others (see Table H) not only examine graduates of all medical colleges but also admit osteopaths to the physicians' and surgeons' examination. Some boards hold careful examinations which include practical laboratory and clinical tests or they mark the papers more severely, while others, especially partisan boards, are very lenient. It is particularly important, in forming conclusions based on these statistics to note for each college the states in which its graduates are not admitted to examination—information set forth with these statistics in Table D. A state board which admits to its examinations graduates of low-grade medical schools would be expected to have a higher percentage of failures.

Undergraduates and Osteopaths Examined as Physicians During 1922

For the last four years the few undergraduates examined have been accidental instances due evidently to imperfect credentials. In 1906, there were 703 undergraduates examined, and 342 were licensed. Colorado is now the only state which will knowingly admit nongraduates to its examinations, but only seven have been licensed in that state in sixteen years. The door has been closed, therefore, against the admission to practice of those whose medical training is known to be incomplete. At present, however, several boards register as physicians and surgeons, by examination or by reciprocity, graduates of osteopathic colleges—no one of which compares favorably with the lowest grade Class C medical college. In one of these states—Texas[1]—the board refuses to admit graduates of Class C medical schools to its examinations but nevertheless continues to examine graduates of osteopathic colleges which, in fact, are nothing more than very low-grade medical schools.

Recent Graduates Examined During 1922

Table B gives the results for graduates of 1918 to 1922, inclusive, examined during 1922. This table is important, since it deals with recent graduates, and is, therefore, the fairest basis for comparison between colleges. Of all candidates examined in 1922, 3,285, or 82.3 per cent., were recent graduates, and of this number 7.3 per cent. failed, as compared with 12.3 per cent. for all candidates.

Old Practitioners Examined During 1922

Table C in so arranged as to show in comparison the results for graduates of all years (first column), for recent graduates (second column), for graduates of 1917 and previous years (third column), and for graduates of 1922 (fourth column). Of the graduates of 1917 and previous years—"old practitioners"—563 were examined, and of this number 188, or 33.4 per cent., failed, as compared with 7.3 per cent. of failures for recent graduates. The total number of these candidates is diminishing[2] as state licensing boards extend the provision for reciprocity, or for the endorsement, without further examination of licenses granted by other states where a physician's qualifications are otherwise satisfactory. As a rule, the states which have limited or no reciprocal relations with other states (Connecticut, Massachusetts, New York, Oregon and Rhode Island, see Table G) examined the largest number of old practitioners.

Graduates of 1922 Examined During 1922

Table C also gives the results for the graduates of 1922 who were examined during the year by the state boards, and shows that 2,138, or 53.5 per cent., of all candidates examined

(CONTINUED ON PAGE 1227)

1. See Table D on pages 1226 and 1227.
2. See Table 2 on p. 1230.

Marginal Number	NAME OF COLLEGE	1 Alabama P	1 Alabama F	2 Arizona P	2 Arizona F	3 Arkansas P	3 Arkansas F	4 California P	4 California F	5 Colorado P	5 Colorado F	6 Connecticut P	6 Connecticut F	7 Delaware P	7 Delaware F	8 Dist. Columbia P	8 Dist. Columbia F	9 Florida P	9 Florida F	10 Georgia P	10 Georgia F	11 Idaho P	11 Idaho F	12 Illinois P	12 Illinois F	13 Indiana P	13 Indiana F	14 Iowa P	14 Iowa F	15 Kansas P	15 Kansas F	16 Kentucky P	16 Kentucky F	17 Louisiana P	17 Louisiana F	18 Maine P	18 Maine F	19 Maryland P	19 Maryland F	20 Massachusetts P	20 Massachusetts F	21 Michigan P	21 Michigan F	22 Minnesota P	22 Minnesota F	Marginal Number
	ARKANSAS																																													
1	University of Arkansas Medical Department					1	0											0	1																											1
	CALIFORNIA																																													
2	College of Medical Evangelists							21	0																																	1	0			2
3	Stanford University School of Medicine							27	1																																					3
4	University of California Medical School							41	0																																					4
	COLORADO																																													
5	University of Colorado School of Medicine									14	0																									1	0							5
	CONNECTICUT																																												
6	Yale University School of Medicine							1	0			9	1																							6	0			4	0			6
	DISTRICT OF COLUMBIA																																												
7	Georgetown University School of Medicine			1	0											16	0																							2	0			7
8	George Washington University Medical School											1	0			15	0					1	0	1	0																			8
9	Howard University School of Medicine															12	5	1	0					2	1													0	2	1	0			9
	GEORGIA																																												
10	Emory University School of Medicine	8	0															10	0	45	0			3	1																			10
11	University of Georgia Medical Department																	5	4	13	0																			1	0			11
	ILLINOIS																																												
12	Chicago Medical School																							10	15															1	0			12
13	Hahnemann Medical College			0	1			1	1			2	0											12	0																			13
14	Loyola University School of Medicine							0	1													2	0	19	4															1	0			14
15	Northwestern University Medical School			1	0			1	0									0	1			1	0	69	2			3	0	1	0	1	0							2	0	2	0	15
16	Rush Medical College (University of Chicago)							23	1			1	0					3	1			1	0	98	6	1	0	2	0	2	0									1	0	2	0	16
17	University of Illinois College of Medicine							4	0									1	0					46	1	1	0													1	0	1	0	17
	INDIANA																																												
18	Indiana University School of Medicine																	1	0							31	0																	18
	IOWA																																												
19	State University of Iowa College of Medicine																							2	0			37	0											2	0			19
	KANSAS																																												
20	University of Kansas School of Medicine																													18	0									1	0			20
	KENTUCKY																																												
21	University of Louisville Medical Department							0	1															1	0							22	0									21
	LOUISIANA																																												
22	Tulane University of Louisiana School of Medicine	11	0	2	0	3	0					1	0					6	0					1	0									46	0							22
	MARYLAND																																												
23	Johns Hopkins University Medical Department							5	0			4	1	1	0	1	0	2	0																	1	0	41	0	7	0	5	0	23
24	Univ. of Md. School of Med. and Coll. of P. & S.											3	0	1	0	1	0	3	0			1	0											1	0			27	0	2	1			24
	MASSACHUSETTS																																												
25	Boston University School of Medicine																																			3	0			19	0			1	0	25
26	College of Physicians and Surgeons, Boston											0	1			1	1							0	1							1	0							3	7			26
27	Harvard University Medical School					1	0	1	0			6	0			1	0	2	1	1	0	1	0	3	0			2	0	1	0					4	0			39	0	2	0	3	0	27
28	Middlesex College of Medicine and Surgery.—N.											13	1																											27	15					28
29	Tufts College Medical School											7	0																	1	0					8	0			64	2			1	0	29
	MICHIGAN																																												
30	Detroit College of Medicine and Surgery							0	1																																	20	1			30
31	University of Michigan Medical School			1	0			1	0									1	0	1	0			0	1															3	0	65	0			31
	MINNESOTA																																												
32	University of Minnesota Medical School							2	0							0	1					2	0					1	0															32
	MISSOURI																																												
33	Kansas City College of Medicine and Surgery.—N.					15	1			0	2	2	1																															33
34	Kansas City University of Phys. and Surgs.—N.									2	8	2	0																											2	2			34
35	St. Louis College of Physicians and Surgeons							0	1	1	8	8	2											0	1															5	12			35
36	St. Louis University School of Medicine							2	1															1	0									1	0					1	0			36
37	Washington University School of Medicine							2	0	1	0													1	0					2	0									1	1			37
	NEBRASKA																																												
38	Creighton University College of Medicine																					1	0	2	0					1	0											38
39	University of Nebraska College of Medicine							1	0															0	1																			39
	NEW YORK																																												
40	Albany Medical College																																												40
41	Columbia University College of Phys. and Surgs.	1	0									6	0					1	0																					6	0			41
42	Cornell University Medical College											1	0							1	0																							42
43	Long Island College Hospital											1	0					0	1																									43
44	New York Homeo. Med. Coll. & Flower Hosp.—H.																																										1	0	44
45	Syracuse University College of Medicine																							2	1															1	0			45
46	University and Bellevue Hospital Medical College							1	0							1	0											1	0											3	0			46
47	University of Buffalo Medical Department											1	0					1	0																									47
	OHIO																																												
48	Eclectic Medical College.—E.					2	0	1	0	1	0	1	0							1	0											4	0									2	1	48
49	Ohio State University College of Medicine																	1	0	1	0																			1	0			49
50	University of Cincinnati College of Medicine							2	1															2	0																			50
51	Western Reserve University School of Medicine																																												51
	OKLAHOMA																																												
52	University of Oklahoma School of Medicine																	1	0																									52
	OREGON																																												
53	University of Oregon Medical School							1	0																																			53
	PENNSYLVANIA																																												
54	Hahnemann Medical College and Hospital.—H.			0	1									2	0																									3	0			54
55	Jefferson Medical College	2	0	1	0			1	2			4	6	3	0			1	0	2	0									1	0							1	0	2	0			55
56	Temple University School of Medicine											1	0	5	0																											1	0	56
57	University of Pennsylvania School of Medicine							4	1			1	2	3	0			2	0									1	0													1	0	57
58	University of Pittsburgh School of Medicine																																												58
59	Woman's Medical College of Pennsylvania							1	0			1	0																											3	0			59
	SOUTH CAROLINA																																												
60	Medical College of the State of South Carolina																	2	0	1	0																							60
	TENNESSEE																																												
61	Meharry Medical College	3	0																	1	1			3	12							0	4	1	2	1	3							61
62	University of Tennessee College of Medicine	1	0			1	0											1	0																	2	0							62
63	University of West Tennessee Medical Department									1	6																													0	1			63
64	Vanderbilt University School of Medicine	1	0			1	0					1	0																															64
		1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16		17		18		19		20		21		22	

H = Homeopathic; E = Eclectic; N = Nondescript; P = Passed; F = Failed.

	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50						
	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	U. S. Territories and Possessions	Totals	Examined—Passed	Examined—Failed	Percentage of Failures	No. States Exam. in	Marginal Number
	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F						
1																													2	1	1	50.0	2	1
2																		1 0											23	23	0	0.0	3	2
3																					1 0			0 1					30	28	2	6.7	3	3
4																													41	41	0	0.0	1	4
5		1 0																									0 1		17	16	1	5.9	4	5
6									6 1			1 0										1 0							30	28	2	6.7	7	6
7									4 1						3 0																			
8									4 1	1 0				1 0	1 0														28	26	2	7.1	6	7
9		2 0			1 0		2 0		5 2	1 1		1 0			2 0								2 0				1 0	44	33	11	25.0	14	9
10									3 0	3 1							1 0							1 0					76	74	2	2.6	8	10
11																											1 0		24	20	4	16.7	4	11
12		0 1							1 1			1 0		0 1	1 0										1 1		1 0		30	13	17	56.7	5	12
13						1 0						1 1		0 1	2 0				1 0									22	18	4	18.2	8	13
14	6 0	4 0	2 0				1 0					3 0		2 0										1 1				36	28	8	22.2	10	14
15	1 0	1 0							2 0		2 0	1 0		2 0	1 0			6 0	1 0				2 2	1 0	3 0			110	105	5	4.5	19	15
16				3 0									1 0					1 0					0 1	1 0	7 0		3 0	172	163	9	5.2	24	16
17																													61	60	1	1.6	10	17
18			1 0												1 0														34	34	0	0.0	4	18
19			1 0						1 0									4 0						1 0					48	48	0	0.0	7	19
20		4 0																											23	23	0	0.0	3	20
21									2 0			1 0			1 0									1 0			1 0		30	29	1	3.3	8	21
22	2 0	1 0							6 1	5 1			2 0						3 0					2 0					93	91	2	2.1	14	22
23							2 0		19 2			3 0			5 0				1 0				1 0						104	101	3	2.9	17	23
24							1 0		21 1	4 0					3 0				1 0		1 0		1 0		5 0		1 0		79	77	2	2.5	17	24
25									7 0						1 0	1 0													32	32	0	0.0	6	25
26		3 0				1 0	2 0		19 0	1 0		5 0	1 0	1 0		4 0									1 1				17	6	11	64.7	6	26
27						3 0	2 0		9 3			1 0				12 0					1 0		3 0	1 0	1 0	2 0			113	112	1	0.9	28	27
28																									2 0				56	40	16	28.6	2	28
29					1 0				2 0						1 0			1 0											115	110	5	4.3	11	29
30									9 1																			2 0	25	23	2	8.0	4	30
31			1 0																										87	85	2	2.3	1	31
32		1 0			1 0																								86	85	1	1.2	6	32
33		1 1			2 0								1 1														1 1		27	21	6	22.2	7	33
34		5 10											1 0	0 1					1 0										24	12	12	50.0	7	34
35		31 0					1 0														0 1				1 1 0	1 2	0		62	24	38	61.3	13	35
36		40 0	1 0						3 0			4 0		2 0											2 0		3 0		51	50	1	2.0	10	36
37									1 0				1 0		1 0										3 0	1 0			57	56	1	1.8	13	37
38			1 0	21 0					1 0					1 0				2 0			1 1						1 0		33	32	1	3.0	10	38
39				18 0					1 0		1 0							1 0											23	22	1	4.4	6	39
40									12 0																				12	12	0	0.0	1	40
41					1 0	1 0	1 0		75 1						1 0									2 0		1 0		1 0	95	94	1	1.1	9	41
42						1 0			38 0							2 0	1 0						2 0						48	48	0	0.0	9	42
43									45 0							1 0											1 0		49	48	1	2.0	5	43
44									22 4																				27	23	4	14.3	2	44
45	2 0								33 2						2 0														44	41	3	6.8	6	45
46					1 0				79 0			1 0		1 0	3 0	1 0			1 0									2 0	95	95	0	0.0	12	46
47									22 2						1 0														27	25	2	7.5	4	47
48					1 0				5 5			23 0	1 0			1 0													48	42	6	12.5	11	48
49									1 0			31 0			1 0									1 0					37	37	0	0.0	7	49
50												43 0													7 0 1 0				59	58	1	1.7	7	50
51												25 0													1 0 1 0				27	27	0	0.0	3	51
52													6 0				1 0			3 0									11	11	0	0.0	4	52
53									0 1					9 3															14	10	4	28.6	3	53
54							2 1		4 2						32 7														54	43	11	20.4	6	54
55	4 0						2 0		12 3	13 1		4 0			57 0	1 0	4 0		1 0	1 0	2 0		2 0	1 0	11 0	2 0		1 0	139	133	6	4.3	26	55
56							5 0		14 1	6 0	1 0	1 0			22 2														34	32	2	5.9	6	56
57												2 0			60 1				1 0		5 0		2 0	1 0	4 0		2 0	126	121	5	4.0	20	57
58						1 0	1 0		6 1			10 0			37 0													47	47	0	0.0	2	58
59			1 0						1 0						3 0								1 0		1 0				20	19	1	5.0	10	59
60																	13 0												18	18	0	0.0	5	60
61	6 2	2 0								0 2		4 1	1 1		1 0			23 0	2 0						1 1				78	49	29	37.2	15	61
62	1 0								2 1								2 1	10 0	1 0										23	21	2	8.7	9	62
63		1 0							4 0				1 0		1 0			13 0											9	2	7	77.8	3	63
64																													22	22	0	0.0	7	64
	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50						

TABLE A—PHYSICIANS EXAMINED BY STATE B

Marginal Number	NAME OF COLLEGE	1 Alabama P	F	2 Arizona P	F	3 Arkansas P	F	4 California P	F	5 Colorado P	F	6 Connecticut P	F	7 Delaware P	F	8 Dist. Columbia P	F	9 Florida P	F	10 Georgia P	F	11 Idaho P	F	12 Illinois P	F	13 Indiana P	F	14 Iowa P	F	15 Kansas P	F	16 Kentucky P	F	17 Louisiana P	F	18 Maine P	F	19 Maryland P	F	20 Massachusetts P	F	21 Michigan P	F	22 Minnesota P	F	Marginal Number
	TEXAS																																														
65	Baylor University College of Medicine																																	1	0											65
66	University of Texas School of Medicine			1	0			1	0																																					66
	VERMONT																																														
67	University of Vermont College of Medicine											5	3			1	0																							6	0					67
	VIRGINIA																																													
68	Medical College of Virginia											2	0											1	1															0	1					68
69	University of Virginia Department of Medicine															1	0			1	0													1	0					1	0					69
	WISCONSIN																																													
70	Marquette University School of Medicine																							1	1																							70
	CANADA																																													
71	Dalhousie University Faculty of Medicine																																							0	1					71
72	Laval University Faculty of Medicine																																													72
73	McGill University Faculty of Medicine							2	0															0	1													2	0	1	0	2	1			1	0	73
74	Queen's University Faculty of Medicine							1	0	1	0																																			74
75	University of Alberta Faculty of Medicine																																													75
76	University of Manitoba Faculty of Medicine							1	0																					1	0											1	0			76
77	University of Montreal Medical Faculty																																					1	0							77
78	University of Toronto Faculty of Medicine							1	0	1	0							1	0																							5	0	3	0	78
79	Western University Medical School																																											1	0			79
80	Foreign Colleges							8	4	2	0	1	3	1	0			1	1					3	9	1	1	2	0			1	0	2	0			3	0	8	4	3	2	2	0	80
81	Miscellaneous Medical Colleges	4	1			6	0	17	17	0	3	4	1	1	0	4	0	9	11			1	0	3	9					1	1	3	1	1	1	2	0			8	3	7	0	0	1	81
82	Undergraduates and Osteopaths							32	34	8	7	25	10																											13	6					82
83	Totals by States	32		9		31		275		66		140		17		61		77		69		11		334		96		49		33		41		59		28		77		300		123		110		83
84	Totals — Examined — Passed	31		7		30		208		32		114		17		54		56		(8		11		286		35		49		28		37		55		28		74		244		119		107		84
85	Totals — Examined — Failed	1		2		1		67		34		26		0		7		21		1		0		68		1		0		5		4		4		0		3		56		4		3		85
86	Percentage of Failures	3.1		22.2		3.2		24.4		51.5		18.6		0.0		11.5		27.3		1.4		0.0		16.4		2.8		0.0		15.2		9.8		6.8		0.0		3.9		18.7		3.3		2.7		86
		1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16		17		18		19		20		21		22		

H = Homeopathic; E = Eclectic; N = Nondescript; P = Passed; F = Failed.

TABLE B—GRADUATES OF 1918 TO 1922, INCLUSIVE, EXAMIN

Marginal Number	NAME OF COLLEGE	1 Alabama P	F	2 Arizona P	F	3 Arkansas P	F	4 California P	F	5 Colorado P	F	6 Connecticut P	F	7 Delaware P	F	8 Dist. Columbia P	F	9 Florida P	F	10 Georgia P	F	11 Idaho P	F	12 Illinois P	F	13 Indiana P	F	14 Iowa P	F	15 Kansas P	F	16 Kentucky P	F	17 Louisiana P	F	18 Maine P	F	19 Maryland P	F	20 Massachusetts P	F	21 Michigan P	F	22 Minnesota P	F	Marginal Number
	ARKANSAS																																													
1	University of Arkansas Medical Department																																													1
	CALIFORNIA																																													
2	College of Medical Evangelists							21	0																																			1	0			2
3	Stanford University School of Medicine							27	1																																					3
4	University of California Medical School							41	0																																					4
	COLORADO																																														
5	University of Colorado School of Medicine									14	0																																					5
	CONNECTICUT																																													
6	Yale University School of Medicine							1	0			8	0																											6	0			2	0			6
	DISTRICT OF COLUMBIA																																													
7	Georgetown University School of Medicine															16	0																									2	0					7
8	George Washington University Medical School															14	0							1	0																					8
9	Howard University School of Medicine															12	5	1	0					2	0															0	2					9
	GEORGIA																																													
10	Emory University School of Medicine	8	0															7	0	45	0			2	1																					10
11	University of Georgia Medical Department																	2	0	13	0																					1	0			11
	ILLINOIS																																													
12	Chicago Medical School																							10	13																	1	0					12
13	Hahnemann Medical College			0	1			1	0			1	0											12	0																					13
14	Loyola University School of Medicine																					1	0	19	2																			1	0			14
15	Northwestern University Medical School			1	0			1	0													1	0	69	2			3	0	1	0	1	0							2	0	2	0			15
16	Rush Medical College (University of Chicago)							22	0									1	0					98	5	1	0	1	0	2	0									1	0	2	0	1	0	16
17	University of Illinois College of Medicine							4	0															46	1	1	0															1	0	1	0	17
	INDIANA																																													
18	Indiana University School of Medicine																									30	0																			18
	IOWA																																													
19	State University of Iowa College of Medicine																							2	0			37	0																	19
	KANSAS																																													
20	University of Kansas School of Medicine																															18	0													20
	KENTUCKY																																													
21	University of Louisville Medical Department																							1	0									21	0											21
		1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16		17		18		19		20		21		22		

H = Homeopathic; E = Eclectic; N = Nondescript; P = Passed; F = Failed.

Marginal Number	22	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	Totals	Examined—Passed	Examined—Failed	Percentage of Failures	No. States Exam. In	Marginal Number
	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	U. S. Territories and Possessions						
	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F						
65									2 1											23 0									27	26	1	3.7	3	65
66									5 0										1 0	41 0						1 0			50	50	0	0.0	6	66
67			1 0			2 0			8 1						1 0							16 0							44	40	4	9.1	8	67
68			1 0						2 0	3 1					2 0								26 0		1 0		1 0		42	39	3	7.1	10	68
69	2 0								2 0										1 0				13 0		2 0				24	24	0	0.0	9	69
70																										21 1			24	22	2	8.3	2	70
71									1 0																			1 0	2	2	0	0.0	2	71
72																													1	0	1	100.0	1	72
73									12 3						2 0	1 0	1 0					1 0						2 0	32	27	5	15.6	11	73
74		1 0					1 0		11 0									1 0											16	16	0	0.0	6	74
75																													0	0	0	0.0	0	75
76																													3	3	0	0.0	3	76
77																													1	1	0	0.0	1	77
78									7 3			1 0				1 0												1 0	24	21	3	12.5	9	78
79														1 0					1 0										3	3	0	0.0	3	79
80		1 0	1 0		1 1		3 9		34 29		1 0	8 3		1 0	10 3	2 0				4 0	0 1			0 2	1 3	4 0		1 1	186	110	76	40.9	30	80
81	2 0	7 1	0 2		4 0	2 0			14 6	0 1	1 2	8 1	4 0	2 1	6 5		1 0	2 0	5 1			1 0	2 0		0 1	3 0	2 1	3 3	214	140	74	34.1	38	81
82	1 0	1 3																		2 0					0 1	1 0			145	83	62	42.8	9	82
83	29	123	13	42	14	12	35	0	679	45	8	189	22	30	283	27	25	19	66	77	14	19	55	12	51	63	11	32	3998	....	....	.....	...	83
84	27	107	11	42	13	12	25	0	599	37	6	183	20	23	265	27	24	19	65	77	11	19	55	6	42	60	8	28	....	3501	....	.....	...	84
85	2	16	2	0	1	0	10	0	80	8	2	6	2	7	18	0	1	0	1	0	3	0	0	6	9	3	3	4	....	....	492	.....	...	85
86	6.9	13.0	15.4	0.0	7.2	0.0	28.6	0.0	11.8	17.8	25.0	3.2	9.1	23.3	6.4	0.0	4.0	0.0	1.5	0.0	21.4	0.0	0.0	50.0	17.6	4.8	27.3	12.8	....	....	....	12.3	...	86
	22	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50						

EXAMINED BY BOARDS DURING 1922

Marginal Number	22	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	Totals	Examined—Passed	Examined—Failed	Percentage of Failures	No. States Exam. In	Marginal Number
	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	U. S. Territories and Possessions						
	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F						
1																													0	0	0	0.0	0	1
2																		1 0											23	23	0	0.0	3	2
3																					1 0								29	28	1	3.4	2	3
4																													41	41	0	0.0	1	4
5		1 0																									0 1		16	15	1	6.3	3	5
6									5 0			1 0										1 0							24	24	0	0.0	7	6
7									3 0						3 0														24	24	0	0.0	4	7
8									2 0	1 0					1 0														19	19	0	0.0	4	8
9		2 0					2 0		5 1	1 1		1 0			2 0								2 0					1 0	40	31	9	22.5	12	9
10									3 0	3 1															1 0				71	69	2	2.8	7	10
11																													16	16	0	0.0	3	11
12		0 1																							1 1		1 0		28	13	15	53.6	5	12
13									1 0			1 0																	17	16	1	5.0	6	13
14												1 1		0 1	2 0				1 0										29	25	4	13.8	7	14
15	6 0	4 0	2 0				1 0					3 0			1 0			6 0	1 0				2 2	1 0	2 0				106	102	4	3.8	17	15
16	1 0	1 0							1 0		2 0	1 0		2 0	1 0									1 0	6 0		3 0		160	155	5	3.1	21	16
17				1 0																									55	54	1	1.8	6	17
18			1 0												1 0														32	32	0	0.0	3	18
19																		3 0							1 0				43	43	0	0.0	4	19
20		4 0																											22	22	0	0.0	2	20
21									2 0						1 0										1 0				26	26	0	0.0	5	21
	22	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50						

Marginal Number	NAME OF COLLEGE	1 Alabama P	1 Alabama F	2 Arizona P	2 Arizona F	3 Arkansas P	3 Arkansas F	4 California P	4 California F	5 Colorado P	5 Colorado F	6 Connecticut P	6 Connecticut F	7 Delaware P	7 Delaware F	8 Dist. Columbia P	8 Dist. Columbia F	9 Florida P	9 Florida F	10 Georgia P	10 Georgia F	11 Idaho P	11 Idaho F	12 Illinois P	12 Illinois F	13 Indiana P	13 Indiana F	14 Iowa P	14 Iowa F	15 Kansas P	15 Kansas F	16 Kentucky P	16 Kentucky F	17 Louisiana P	17 Louisiana F	18 Maine P	18 Maine F	19 Maryland P	19 Maryland F	20 Massachusetts P	20 Massachusetts F	21 Michigan P	21 Michigan F	22 Minnesota P	22 Minnesota F
	LOUISIANA																																												
22	Tulane University of Louisiana School of Medicine	11	0	2	0	3	0	..	..	..	..	1	0	..	..	..	..	5	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	46	0	..	..	..	..	..	..	..	..	..	..
	MARYLAND																																												
23	Johns Hopkins University Medical Department	..	..	..	..	..	..	5	0	..	..	2	1	1	0	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	41	0	5	0	4	0	2	0
24	Univ. of Md. School of Med. and Coll. of P. & S.	..	..	..	..	..	..	..	..	..	..	3	0	1	0	1	0	2	0	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	25	0	2	1	..	..	..	..
	MASSACHUSETTS																																												
25	Boston University School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	0	..	..	19	0	..	..	1	0
26	College of Physicians and Surgeons, Boston	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	2	3	..	..	..	..
27	Harvard University Medical School	..	..	..	..	1	0	1	0	..	..	5	0	..	..	1	0	1	0	1	0	1	0	2	0	..	..	2	0	..	..	..	..	..	..	3	0	..	..	38	0	2	0	1	0
28	Middlesex College of Medicine and Surgery.—N.	..	..	..	..	..	..	..	..	..	..	13	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	27	15	..	..	..	..
29	Tufts College Medical School	..	..	..	..	..	..	..	..	..	..	5	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	8	0	..	..	64	1	..	..	1	0
	MICHIGAN																																												
30	Detroit College of Medicine and Surgery	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	20	1	..	..
31	University of Michigan Medical School	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	0	65	0	..	..
	MINNESOTA																																												
32	University of Minnesota Medical School	..	..	..	..	..	..	2	0	..	..	..	..	..	..	0	1	..	..	..	..	2	0	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	75	0
	MISSOURI																																												
33	Kansas City College of Medicine and Surgery.—N.	..	..	..	..	14	1	..	..	0	2	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
34	Kansas City University of Phys. and Surgs.—N.	..	..	..	..	..	..	..	..	2	8	2	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	..	..	..	..	..	..	..	..	2	2	..	..
35	St. Louis College of Physicians and Surgeons	..	..	..	..	..	..	..	..	1	8	8	2	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	1	0	..	..	..	..	..	..	5	12	..	..	..	..
36	St. Louis University School of Medicine	..	..	..	..	..	..	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..
37	Washington University School of Medicine	..	..	..	..	..	..	2	0	1	0	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	2	0	..	..	..	..	..	..	..	..	..	..	..	..	1	0
	NEBRASKA																																												
38	Creighton University College of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	0	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..
39	University of Nebraska College of Medicine	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	NEW YORK																																												
40	Albany Medical College	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
41	Columbia University College of Phys. and Surgs.	..	..	..	..	..	..	..	..	..	..	4	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	0	..	..	..	..
42	Cornell University Medical College	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
43	Long Island College Hospital	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
44	New York Homeo. Med. Coll. & Flower Hosp.—H.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0
45	Syracuse University College of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0
46	University and Bellevue Hospital Medical College	..	..	..	..	..	..	1	0	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	2	0	..	..	..	..
47	University of Buffalo Medical Department	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	OHIO																																												
48	Eclectic Medical College.—E.	..	..	..	..	2	0	1	0	..	..	1	0	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	4	0	..	..	..	..	..	..	..	..	2	1	..	..
49	Ohio State University College of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..
50	University of Cincinnati College of Medicine	..	..	..	..	..	..	3	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0
51	Western Reserve University School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	OKLAHOMA																																												
52	University of Oklahoma School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	OREGON																																												
53	University of Oregon Medical School	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	PENNSYLVANIA																																												
54	Hahnemann Medical College and Hospital.—H.	..	..	0	1	..	..	..	..	..	..	..	..	2	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	0	..	..	..	..
55	Jefferson Medical College	2	0	..	..	..	..	1	0	..	..	4	0	3	0	..	..	..	..	2	0	..	..	..	..	..	..	..	..	1	0	..	..	..	..	1	0	..	..	1	0	..	..	1	0
56	Temple University School of Medicine	..	..	..	..	..	..	..	..	..	..	1	0	5	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	0	..	..	..	..
57	University of Pennsylvania School of Medicine	..	..	..	..	..	..	4	0	..	..	1	1	3	0	..	..	2	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	0
58	University of Pittsburgh School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
59	Woman's Medical College of Pennsylvania	..	..	..	..	..	..	1	0	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	1	0
	SOUTH CAROLINA																																												
60	Medical College of the State of South Carolina	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	TENNESSEE																																												
61	Meharry Medical College	3	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	0	3	..	..	..	..	0	4	1	2	1	1	..	..	..	..	..	..	..	..	..	..
62	University of Tennessee College of Medicine	1	0	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	0	..	..	..	..	..	..	..	..	..	..
63	University of West Tennessee Medical Department	..	..	..	..	..	..	..	..	1	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
64	Vanderbilt University School of Medicine	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	TEXAS																																												
65	Baylor University College of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
66	University of Texas School of Medicine	..	..	1	0	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	VERMONT																																												
67	University of Vermont College of Medicine	..	..	..	..	..	..	..	..	..	..	5	2	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	0	..	..
	VIRGINIA																																												
68	Medical College of Virginia	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
69	University of Virginia Department of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	1	0	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	1	0	..	..	..	..	..	..
	WISCONSIN																																												
70	Marquette University School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	CANADA																																												
71	Dalhousie University Faculty of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
72	Laval University Faculty of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
73	McGill University Faculty of Medicine	..	..	..	..	..	..	2	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	2	0	1	0	2	1	..	..	..	..
74	Queen's University Faculty of Medicine	..	..	..	..	..	..	1	0	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
75	University of Alberta Faculty of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
76	University of Manitoba Faculty of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	1	0
77	University of Montreal Medical Faculty	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..
78	University of Toronto Faculty of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	0
79	Western University Medical School	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0
80	Foreign Colleges	..	..	..	..	..	..	3	2	2	0	1	2	1	0	..	..	..	..	..	..	..	..	2	3	0	1	2	0	..	..	..	..	..	..	..	..	1	0	0	2	2	1	1	0
81	Miscellaneous Medical Colleges	..	..	..	..	..	..	17	4	..	..	1	0	1	0	2	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	2	1	7	0	..	..
82	Undergraduates and Osteopaths	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
83	**Totals by States**	26		7		22		176		46		83		17		58		24		68		6		310		33		48		30		36		51		24		72		234		115		9	
84	Totals — Examined — Passed	26		5		21		167		22		73		17		51		24		68		6		275		32		48		26		32		50		24		70		196		112		9	
85	Totals — Examined — Failed	0		2		1		9		24		10		0		7		0		0		0		35		1		0		4		4		1		0		2		38		3		1	
86	Percentage of Failures	0.0		28.6		4.5		5.1		52.2		12.0		0.0		12.0		0.0		0.0		0.0		11.3		3.0		0.0		13.3		11.1		2.0		0.0		2.8		16.2		2.6		0.0	
		1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16		17		18		19		20		21		22	

H = Homeopathic; E = Eclectic; N = Nondescript; P = Passed; F = Failed.

| Marginal Number | 23 Mississippi | | 24 Missouri | | 25 Montana | | 26 Nebraska | | 27 Nevada | | 28 New Hampshire | | 29 New Jersey | | 30 New Mexico | | 31 New York | | 32 North Carolina | | 33 North Dakota | | 34 Ohio | | 35 Oklahoma | | 36 Oregon | | 37 Pennsylvania | | 38 Rhode Island | | 39 South Carolina | | 40 South Dakota | | 41 Tennessee | | 42 Texas | | 43 Utah | | 44 Vermont | | 45 Virginia | | 46 Washington | | 47 West Virginia | | 48 Wisconsin | | 49 Wyoming | | 50 U. S. Territories and Possessions | | Totals | Examined—Passed | Examined—Failed | Percentage of Failures | No. States Exam. in | Marginal Number |
|---|---|---

Marginal Number	NAME OF COLLEGE	Graduates of All Years					Graduates of 1918–1922					Graduates of 1917 and Previous					Graduates of 1922					Marginal Number
		Number Examined	Number Passed	Number Failed	Per Cent. Failed	Number of States	Number Examined	Number Passed	Number Failed	Per Cent. Failed	Number of States	Number Examined	Number Passed	Number Failed	Per Cent. Failed	Number of States	Number Examined	Number Passed	Number Failed	Per Cent. Failed	Number of States	
	ARKANSAS																					
1	University of Arkansas Medical Department	2	1	1	50.0	2	0	0	0	0.0	0	2	1	1	50.0	2	0	0	0	0.0	0	1
	CALIFORNIA																					
2	College of Medical Evangelists	23	23	0	0.0	3	23	23	0	0.0	3	0	0	0	0.0	0	23	23	0	0.0	3	2
3	Stanford University School of Medicine	30	28	2	6.7	3	29	28	1	3.4	2	1	0	1	100.0	1	27	27	0	0.0	2	3
4	University of California Medical School	41	41	0	0.0	1	41	41	0	0.0	1	0	0	0	0.0	0	39	39	0	0.0	1	4
	COLORADO																					
5	University of Colorado School of Medicine	17	16	1	5.9	4	16	15	1	6.3	3	1	1	0	0.0	1	16	15	1	6.3	3	5
	CONNECTICUT																					
6	Yale University School of Medicine	30	28	2	6.7	7	24	24	0	0.0	7	6	4	2	33.3	3	16	16	0	0.0	4	6
	DISTRICT OF COLUMBIA																					
7	Georgetown University School of Medicine	28	26	2	7.1	6	24	24	0	0.0	4	4	2	2	50.0	3	14	14	0	0.0	3	7
8	George Washington University Medical School	27	26	1	3.7	9	19	19	0	0.0	4	8	7	1	12.5	6	13	13	0	0.0	2	8
9	Howard University School of Medicine	44	33	11	25.0	14	40	31	9	22.5	12	4	2	2	50.0	4	5	5	0	0.0	3	9
	GEORGIA																					
10	Emory University School of Medicine	76	74	2	2.6	8	71	69	2	2.8	7	5	5	0	0.0	3	63	62	1	1.6	6	10
11	University of Georgia Medical Department	24	20	4	16.7	4	16	16	0	0.0	3	8	4	4	50.0	2	13	13	0	0.0	0	11
	ILLINOIS																					
12	Chicago Medical School	30	13	17	56.7	5	28	13	15	53.6	5	2	0	2	100.0	1	23	10	13	56.5	3	12
13	Hahnemann Medical College	22	18	4	18.2	8	17	16	1	5.9	6	5	2	3	60.0	5	13	13	0	0.0	4	13
14	Loyola University School of Medicine	36	28	8	22.2	10	29	25	4	13.8	7	7	3	4	57.1	5	21	20	1	4.8	3	14
15	Northwestern University Medical School	110	105	5	4.5	19	106	102	4	3.8	17	4	3	1	25.0	3	97	94	3	3.1	12	15
16	Rush Medical College (University of Chicago)	172	163	9	5.2	24	160	155	5	3.1	21	12	8	4	33.3	9	134	129	5	3.7	14	16
17	University of Illinois College of Medicine	61	60	1	1.6	10	55	54	1	1.8	6	6	6	0	0.0	5	55	54	1	1.8	6	17
	INDIANA																					
18	Indiana University School of Medicine	34	34	0	0.0	4	32	32	0	0.0	3	2	2	0	0.0	2	30	30	0	0.0	1	18
	IOWA																					
19	State University of Iowa College of Medicine	48	48	0	0.0	7	43	43	0	0.0	4	5	5	0	0.0	4	40	40	0	0.0	3	19
	KANSAS																					
20	University of Kansas School of Medicine	23	23	0	0.0	3	22	22	0	0.0	2	1	1	0	0.0	1	22	22	0	0.0	3	20
	KENTUCKY																					
21	University of Louisville Medical Department	30	29	1	3.3	8	26	26	0	0.0	5	4	3	1	25.0	4	23	23	0	0.0	3	21
	LOUISIANA																					
22	Tulane University of Louisiana School of Medicine	93	91	2	2.1	14	90	89	1	1.1	13	3	2	1	33.3	3	64	63	1	1.6	9	22
	MARYLAND																					
23	Johns Hopkins University Medical Department	104	101	3	2.9	17	88	86	2	2.3	14	16	15	1	6.3	7	46	45	1	23.9	6	23
24	Univ. of Md. School of Med. and Coll. of P. & S	79	77	2	2.5	17	74	72	2	2.7	16	5	5	0	0.0	4	52	52	0	0.0	10	24
	MASSACHUSETTS																					
25	Boston University School of Medicine	32	32	0	0.0	6	32	32	0	0.0	6	0	0	0	0.0	0	25	25	0	0.0	3	25
26	College of Physicians and Surgeons, Boston	17	6	11	64.7	6	8	4	4	50.0	3	9	2	7	77.8	4	1	1	0	0.0	1	26
27	Harvard University Medical School	113	112	1	0.9	28	102	102	0	0.0	28	11	10	1	9.1	7	55	55	0	0.0	13	27
28	Middlesex College of Medicine and Surgery.—N.	56	40	16	28.6	2	56	40	16	28.6	2	0	0	0	0.0	0	27	20	7	25.9	2	28
29	Tufts College Medical School	115	110	5	4.3	11	107	104	3	2.8	11	8	6	2	25.0	5	67	66	1	1.5	4	29
	MICHIGAN																					
30	Detroit College of Medicine and Surgery	25	23	2	8.0	4	23	22	1	4.4	2	2	1	1	50.0	2	21	20	1	4.8	1	30
31	University of Michigan Medical School	87	85	2	2.3	11	83	82	1	1.2	8	4	3	1	25.0	4	68	68	0	0.0	4	31
	MINNESOTA																					
32	University of Minnesota Medical School	86	85	1	1.2	6	85	84	1	1.2	6	1	1	0	0.0	1	76	76	0	0.0	3	32
	MISSOURI																					
33	Kansas City College of Medicine and Surgery.—N.	27	21	6	22.2	7	25	20	5	20.0	7	2	1	1	50.0	2	18	16	2	11.1	3	33
34	Kansas City University of Phys. and Surgs.—N.	24	12	12	50.0	7	24	12	12	50.0	7	0	0	0	0.0	0	11	5	6	36.3	3	34
35	St. Louis College of Physicians and Surgeons	62	24	38	61.3	13	57	24	33	22.8	11	5	0	5	100.0	3	28	14	14	50.0	7	35
36	St. Louis University School of Medicine	51	50	1	2.0	10	46	45	1	2.2	9	5	5	0	0.0	3	36	36	0	0.0	7	36
37	Washington University School of Medicine	57	56	1	1.8	13	52	52	0	0.0	10	5	4	1	20.0	4	36	36	0	0.0	5	37
	NEBRASKA																					
38	Creighton University College of Medicine	33	32	1	3.0	10	31	30	1	3.2	8	2	2	0	0.0	2	22	22	0	0.0	3	38
39	University of Nebraska College of Medicine	23	22	1	4.4	6	22	22	0	0.0	5	1	0	1	100.0	1	18	18	0	0.0	1	39
	NEW YORK																					
40	Albany Medical College	12	12	0	0.0	1	12	12	0	0.0	1	0	0	0	0.0	0	12	12	0	0.0	1	40
41	Columbia University College of Phys. and Surgs.	95	94	1	1.1	9	85	84	1	1.2	6	10	10	0	0.0	7	54	53	1	1.9	1	41
42	Cornell University Medical College	48	48	0	0.0	9	46	46	0	0.0	7	2	2	0	0.0	2	31	31	0	0.0	2	42
43	Long Island College Hospital	49	48	1	2.0	5	46	46	0	0.0	2	3	2	1	33.3	3	43	43	0	0.0	2	43
44	New York Homeo. Med. Coll. & Flower Hosp.—H	27	23	4	14.3	2	22	20	2	9.1	2	5	3	2	40.0	2	18	17	1	5.6	1	44
45	Syracuse University College of Medicine	44	41	3	6.8	6	42	39	3	7.1	5	2	2	0	0.0	2	32	30	2	6.2	1	45
46	University and Bellevue Hospital Medical College	95	95	0	0.0	12	90	90	0	0.0	9	5	5	0	0.0	5	79	79	0	0.0	5	46
47	University of Buffalo Medical Department	27	25	2	7.5	4	27	25	2	7.5	4	0	0	0	0.0	0	20	19	1	5.0	1	47
	OHIO																					
48	Eclectic Medical College.—E.	48	42	6	12.5	11	44	38	6	13.6	9	4	4	0	0.0	4	42	37	5	11.9	9	48
49	Ohio State University College of Medicine	37	37	0	0.0	7	37	37	0	0.0	7	0	0	0	0.0	0	32	32	0	0.0	2	49
50	University of Cincinnati College of Medicine	59	58	1	1.7	7	59	58	1	1.7	7	0	0	0	0.0	0	46	46	0	0.0	3	50
51	Western Reserve University School of Medicine	27	27	0	0.0	3	27	27	0	0.0	3	0	0	0	0.0	0	25	25	0	0.0	1	51
	OKLAHOMA																					
52	University of Oklahoma School of Medicine	11	11	0	0.0	4	9	9	0	0.0	2	2	2	0	0.0	2	2	2	0	0.0	1	52
	OREGON																					
53	University of Oregon Medical School	14	10	4	28.6	3	14	10	4	28.6	3	0	0	0	0.0	0	14	13	1	7.2	3	53
	PENNSYLVANIA																					
54	Hahnemann Medical College and Hospital.—H.	54	43	11	20.4	6	52	41	11	21.1	6	2	2	0	0.0	2	1	1	0	0.0	1	54
55	Jefferson Medical College	139	133	6	4.3	26	130	127	3	2.3	24	9	6	3	33.3	7	34	33	1	8.8	14	55
56	Temple University School of Medicine	34	32	2	5.9	6	34	32	2	5.9	6	0	0	0	0.0	0	2	2	0	0.0	1	56
57	University of Pennsylvania School of Medicine	126	121	5	4.0	20	114	112	2	1.8	18	12	9	3	25.0	7	16	16	0	0.0	3	57
58	University of Pittsburgh School of Medicine	47	47	0	0.0	2	47	47	0	0.0	2	0	0	0	0.0	0	17	17	0	0.0	1	58
59	Woman's Medical College of Pennsylvania	20	19	1	5.0	10	17	16	1	5.9	9	3	3	0	0.0	2	6	6	0	0.0		59
	SOUTH CAROLINA																					
60	Medical College of the State of South Carolina	18	18	0	0.0	5	15	15	0	0.0	3	3	3	0	0.0	2	21	19	2	9.5	3	60
	TENNESSEE																					
61	Meharry Medical College	78	49	29	37.2	15	57	42	15	26.3	12	21	7	14	66.7	7	32	31	1	15.6	7	61
62	University of Tennessee College of Medicine	23	21	2	8.7	9	19	18	1	5.3	7	4	3	1	25.0	2	13	13	0	0.0	5	62
63	University of West Tennessee Medical Department	9	2	7	77.8	3	8	2	6	75.0	2	1	0	1	100.0	1	2	0	2	100.0	1	63
64	Vanderbilt University School of Medicine	22	22	0	0.0	7	18	18	0	0.0	4	4	4	0	0.0	4	13	13	0	0.0		64
	TEXAS																					
65	Baylor University College of Medicine	27	26	1	3.6	4	24	23	1	4.2	3	3	3	0	0.0	2	22	22	0	0.0	2	65
66	University of Texas School of Medicine	50	50	0	0.0	6	48	48	0	0.0	5	2	2	0	0.0	1	41	41	0	0.0	1	66

H = Homeopathic; E = Eclectic; N = Nondescript.

Marginal Number	NAME OF COLLEGE	Graduates of All Years: Number Examined	Number Passed	Number Failed	Per Cent. Failed	Number of States	Graduates of 1918–1922: Number Examined	Number Passed	Number Failed	Per Cent. Failed	Number of States	Graduates of 1917 and Previous: Number Examined	Number Passed	Number Failed	Per Cent. Failed	Number of States	Graduates of 1922: Number Examined	Number Passed	Number Failed	Per Cent. Failed	Number of States	Marginal Number
	VERMONT																					
67	University of Vermont College of Medicine	44	40	4	9.1	8	40	37	3	7.5	7	4	3	1	25.0	4	18	18	0	0.0	4	67
	VIRGINIA																					
68	Medical College of Virginia	42	39	3	7.1	10	37	35	2	5.4	8	5	4	1	20.0	5	26	26	0	0.0	3	68
69	University of Virginia Department of Medicine	24	24	0	0.0	9	23	23	0	0.0	9	1	1	0	0.0	1	10	10	0	0.0	3	69
	WISCONSIN																					
70	Marquette University School of Medicine	24	22	2	8.3	2	22	20	2	9.1	2	2	2	0	0.0	2	20	19	1	5.0	1	70
	CANADA																					
71	Dalhousie University Faculty of Medicine	2	2	0	0.0	2	1	1	0	0.0	1	1	1	0	0.0	1	0	0	0	0.0	0	71
72	Laval University Faculty of Medicine	1	0	1	100.0	1	0	0	0	0.0	0	1	0	1	100.0	1	0	0	0	0.0	0	72
73	McGill University Faculty of Medicine	32	27	5	15.6	12	23	18	5	21.8	9	9	9	0	0.0	5	4	4	0	0.0	3	73
74	Queen's University Faculty of Medicine	16	16	0	0.0	6	10	10	0	0.0	3	6	6	0	0.0	3	1	1	0	0.0	1	74
75	University of Alberta Faculty of Medicine	0	0	0	0.0	0	0	0	0	0.0	0	0	0	0	0.0	0	0	0	0	0.0	0	75
76	University of Manitoba Faculty of Medicine	3	3	0	0.0	3	2	2	0	0.0	2	1	1	0	0.0	1	0	0	0	0.0	0	76
77	University of Montreal Medical Faculty	1	1	0	0.0	1	1	1	0	0.0	1	0	0	0	0.0	0	0	0	0	0.0	0	77
78	University of Toronto Faculty of Medicine	24	21	3	12.5	9	11	9	2	18.2	4	13	12	1	7.7	8	0	0	0	0.0	0	78
79	Western University Medical School	3	3	0	0.0	3	1	1	0	0.0	1	2	2	0	0.0	2	0	0	0	0.0	0	79
80	Foreign Colleges	186	110	76	40.9	30	80	49	31	38.7	23	106	61	45	42.5	23	1	1	0	0.0	1	80
81	Miscellaneous Medical Colleges	214	140	74	34.1	38	65	55	10	15.4	13	149	85	64	43.0	36	30	29	1	3.3	5	81
82	Undergraduates and Osteopaths	145	83	62	42.8	10	0	0	0	0.0	0	0	0	0	0.0	0	0	0	0	0.0	0	82
83	Totals by States	3993	.....	.....	.....	....	3285	.....	.....	.....	....	563	.....	.....	.....	....	2138	.....	.....	.....	....	83
84	Totals — Examined — Passed	.....	3501	.....	.....	....	.....	3043	.....	.....	....	.....	375	.....	.....	....	.....	2061	.....	.....	....	84
85	Totals — Examined — Failed	.....	.....	492	.....	....	.....	.....	242	.....	....	.....	.....	188	.....	....	.....	.....	77	.....	....	85
86	Percentage of Failures	.....	.....	.....	12.3	....	.....	.....	.....	7.3	....	.....	.....	.....	33.4	....	.....	.....	.....	3.1	....	86

H = Homeopathic; E = Eclectic; N = Nondescript.

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during the year, graduated in 1922, including 5 who graduated from Canadian medical colleges. Educational statistics show that the medical colleges of the United States graduated 2,529 students last year; therefore, 84.5 per cent. of all graduated in 1922 took examinations for license during that year. In some of the states, graduates in medicine are allowed to serve as hospital interns without first becoming licensed practitioners, which accounts for some of the remaining 14.7 per cent. Of the 1922 graduates examined, 77, or 3.1 per cent., failed, as compared with 3.7 per cent. in 1921, 7.2 per cent. in 1920, 4.2 per cent. in 1919, and 5.5 per cent. in 1918.

Nonrecognition of Medical Colleges

Table D shows for each college, from official reports, the states in which its diplomas are not given unqualified recognition. Nonrecognition is expressed by different terms in different states. Some boards list colleges as "not in good standing"; some give them as "not reputable"; in New York full recognition is given only to colleges which are "registered," and in Michigan colleges are divided into groups, only those of Group 1 having full recognition. This table also shows the latest rating given to each college by the Council on Medical Education and Hospitals.

From the point of view of the prospective student who may be selecting a medical college, the facts in Table D are of extreme importance. There are 61, or 75.3 per cent. of all medical colleges which have complete recognition in all states. There are 7 others for which the few instances of nonrecognition are due to certain technicalities in state board requirements. If the student gets his medical training in one of the remaining 13 colleges, he will find on graduation that his diploma is not recognized in from 9 to 47 states.

Without the information published in Table D, these state board statistics would be not only incomplete—they would be actually misleading. For example, 56 graduates of the Middlesex College of Medicine and Surgery were examined in 1922. Of these 40 passed and 16, or 28.6 per cent., failed. Note, however, that all these candidates were examined in *two* states, while graduates of this school are reported as not admitted to the examinations for licensure in 46 states!

During the ten years this table has been published, the percentages of fully recognized colleges were, respectively, 29.0, 32.3, 43.7, 65.6, 57.3, 61.3, 67.8, 71.6 and 75.3. This indicates an improvement in the medical colleges. Of the 50 states—counting in Alaska and the District of Columbia—47 state licensing boards, to some extent at least, are now utilizing their legal power to refuse recognition to medical colleges which do not meet the requirements in the respective states. In the other three states, however, either the boards do not have the authority to enforce reasonable standards, or they are not exercising it. In Connecticut the regular and homeopathic boards do not recognize low grade colleges but the eclectic board has evidently assumed the right to recognize any and all colleges not recognized by the other boards.

Arizona reports four colleges not recognized, Wyoming reports three, and Nevada reports one, while Massachusetts and the District of Columbia do not report any as not in good standing. It is evident that if the graduates of low standard medical colleges are not eligible for license in the majority of states, they will flock to these few which still grant liberal recognition. The following states, therefore—Arizona, Connecticut, Massachusetts, Nevada, Wyoming and the District of Columbia—will remain the dumping grounds for the output of low grade medical colleges until the licensing boards obtain and exercise the needed authority to bar them.

It is reported that no examinations were held during the year by the Arkansas Homeopathic Board. There are now only two remaining homeopathic colleges in the United States and none in or near Arkansas.

Table 1.—*Recognition of Medical Colleges (Based on Table D)*

	No. of Colleges
Recognized by all state boards	61
Not recognized by 1 or 2 state boards	7
Not recognized by 9 to 17 state boards	6
Not recognized by 44 to 47 state boards	7
Total	81

The Arkansas eclectic board still examines the graduates of the Kansas City College of Medicine and Surgery, a nominally eclectic affair which is not recognized in 44 other states. This board, however, is not authorized nor does it pretend to examine other than graduates of eclectic colleges. In Connecticut, however, during 1922 the eclectic board of medical examiners licensed by examination 55 applicants, only 8 of whom are found to be graduates of eclectic colleges. Of the 47 other applicants examined, only 2 were graduates of medical schools which are recognized, one each by the regular and homeopathic boards of medical examiners. It is interesting to note, also, that of these regular applicants 11

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TABLE D—RECOGNITION OF MEDICAL COLLEGES

This table, based on official reports, shows in what states diplomas granted by certain medical colleges are not recognized as an acceptable qualification for the license to practice medicine.

Colleges marked (x) have been reported as not recognized by the states in the columns of which the letter appears

| Marginal Number | COLLEGE | Classification by Council on Medical Education † | 1 Alabama | 2 Alaska | 3 Arizona | 4 Arkansas | 5 California | 6 Colorado | 7 Connecticut | 8 Delaware | 9 Dist. of Columbia | 10 Florida | 11 Georgia | 12 Idaho | 13 Illinois | 14 Indiana | 15 Iowa | 16 Kansas | 17 Kentucky | 18 Louisiana | 19 Maine | 20 Maryland | 21 Massachusetts | 22 Michigan | 23 Minnesota | 24 Mississippi | 25 Missouri | 26 Montana | 27 Nebraska | 28 Nevada | 29 New Hampshire | 30 New Jersey | 31 New Mexico | 32 New York | 33 North Carolina | 34 North Dakota | 35 Ohio | 36 Oklahoma | 37 Oregon | 38 Pennsylvania | 39 Rhode Island | 40 South Carolina | 41 South Dakota | 42 Tennessee | 43 Texas | 44 Utah | 45 Vermont | 46 Virginia | 47 Washington | 48 West Virginia | 49 Wisconsin | 50 Wyoming | Reported Non-Recognition by State Licensing Boards: No. of State Boards reporting full recognition | No. of State Boards reporting college not recognized | Percentage of State Boards reporting full recognition | Marginal Number |
|---|---|---

| | | |

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claimed graduation from the St. Louis College of Physicians and Surgeons, a regular college not recognized by 47 states. It appears, therefore, that graduates who are not eligible to take the Connecticut regular medical board's examination need only apply to the eclectic board and be accepted! Furthermore, the list of those registered contains the names of 18 for whom we have no evidence that they graduated from any bona fide medical school!

STUDY OF TOTALS AND PERCENTAGES

A study of totals and percentages (see Table 2) as compared with previous years is of interest. The number examined in 1922 was 814 less than in 1920, the decrease being due to the small "war class"—2,529—which graduated in 1922. It is the smallest number examined since 1918. The fluctuations indicate similar fluctuations in the numbers of graduates in the various years. Statistics regarding physicians licensed in the various states by reciprocity and by other methods are given in Tables G, H, I, J, K and L. By all methods—examination, reciprocity under exemption, etc., 5,497 physicians were licensed during 1922, 851 less than in 1921, 1,060 less than in 1920, and 1,087 less than in 1919, but 1,312 more than in 1918, and 2,368 less than in 1906, when 7,865 physicians were licensed.

STUDY OF LARGER COLLEGES

Table E is also based on the three large tables, and gives the results of state board examinations as they affect the twenty-two larger medical colleges. Although these colleges represent 31.4 per cent. of the seventy medical colleges in the United States having graduates examined in 1922, they furnished 58.4 per cent. of all candidates for license coming from medical schools of the United States. The table shows also that the graduating of large classes by a medical college does not prove excellence of teaching, since four of these have high failure percentages.

TABLE 2.—*Results for This and Previous Years*

Year	All Candidates Examined				Recent Graduates		Older Graduates		Nondescript		Registered without Written Examination	Total Registered
	Examined	Passed	Failed	Percentage Failed	Examined	Percentage Failed	Examined	Percentage Failed	Examined	Percentage Failed		
1904	7035	5672	1363	19.3	4773	14.1	579	29.7	515	52.6	999	6671
1905	7170	5680	1490	20.8	6054	16.2	690	37.7	472	61.9	394	6074
1906	8035	6368	1667	20.7	6250	16.4	793	27.1	708	51.3	1497	7865
1907	7271	5723	1548	21.3	5922	15.1	675	27.7	674	60.6	1426	7149
1908	7770	6084	1686	21.7	6477	17.8	796	31.5	494	56.8	1276	7380
1909	7287	5857	1430	19.6	5891	15.4	958	30.0	438	54.1	1373	7230
1910	7004	5712	1292	18.4	5678	14.9	973	29.1	353	45.6	1040	7352
1911	6960	5578	1382	19.9	5685	17.2	945	29.4	330	38.5	1246	6824
1912	6879	5466	1413	20.5	5770	18.6	856	29.2	253	34.8	1257	6723
1913	6435	5236	1199	18.6	5390	16.5	225	32.1	251	37.8	1265	6501
1914	5570	4370	1200	21.6	4549	17.6	728	30.0	293	61.4	1427	5797
1915	5313	4486	827	15.6	4627	13.2	621	29.3	65	49.2	1386	5872
1916	4850	4123	727	15.0	4283	12.7	567	32.1	.....	.....	1338	5461
1917	4730	4061	669	14.1	4015	10.1	564	32.6	.....	.....	1362	5423
1918	3637	3154	483	13.3	2984	9.3	479	30.5	.....	.....	1031	4185
1919	4736	4060	676	14.3	3904	10.5	766	30.8	66	47.0	2521	6584
1920	4787	4053	734	15.3	3984	11.5	738	33.2	65	50.8	2504	6557
1921	4807	4211	596	12.4	4046	7.8	673	37.3	88	33.0	2137	6348
1922	3993	3501	492	12.3	3285	7.4	563	33.3	83	49.7	1996	5497

TOTALS EXAMINED IN FIVE YEARS

Table F shows the number registered and the number rejected in each state for each of the past five years. A comparison of this table with the statistics in the last educational number of THE JOURNAL (Aug. 19, 1922, p. 637, Table 11) shows—what would be expected—that the states having the several largest numbers of medical graduates examined the largest number of physicians. New York leads, having examined 3,951 candidates in five years, followed by Illinois with 2,228. Altogether, 21,960 physicians were examined by state boards in five years, an average of 4,392 each year.

TABLE E.—*Colleges Having Fifty or More Examined*

COLLEGES	Graduates of All Years					Graduates of 1918-1922					Graduates of 1917 and Previous					Graduates of 1922					Marginal No., Table A
	No. Examined	No. Passed	No. Failed	Per Cent. Failed	No. of States	No. Examined	No. Passed	No. Failed	Per Cent. Failed	No. of States	No. Examined	No. Passed	No. Failed	Per Cent. Failed	No. of States	No. Examined	No. Passed	No. Failed	Per Cent. Failed	No. of States	
Rush Medical College	172	163	9	5.2	24	160	155	5	3.1	21	12	8	4	33.3	9	134	129	5	3.7	14	16
Jefferson Medical College	139	133	6	4.3	26	130	127	3	2.3	24	9	6	3	33.3	7	34	33	1	8.8	14	55
University of Pennsylvania School of Medicine	126	121	5	4.0	20	114	112	2	1.8	18	12	9	3	25.0	7	16	16	0	0.0	8	57
Tufts College Medical School	115	110	5	4.3	11	107	104	3	2.8	11	8	6	2	25.0	5	67	66	1	1.5	4	29
Harvard University Medical School	113	112	1	0.9	28	102	102	0	0.0	28	11	10	1	9.1	7	55	55	0	0.0	13	27
Northwestern University Medical School	110	105	5	4.5	19	106	102	4	3.8	17	4	3	1	25.0	3	97	94	3	3.1	12	15
Johns Hopkins University Medical Department	104	101	3	2.9	17	88	86	2	2.3	14	16	15	1	6.3	7	46	45	1	23.9	6	23
Columbia University College of Phys. and Surgs.	95	94	1	1.1	9	85	84	1	1.2	6	10	10	0	0.0	7	54	53	1	1.9	1	41
University and Bellevue Hosp. Med. College	95	95	0	0.0	12	90	90	0	0.0	9	5	5	0	0.0	5	79	79	0	0.0	5	46
Tulane University School of Medicine	93	91	2	2.1	14	90	89	1	1.1	13	3	2	1	33.3	3	64	63	1	1.6	9	22
University of Michigan Medical School	87	85	2	2.3	11	83	82	1	1.2	8	4	3	1	25.0	4	68	68	0	0.0	4	31
University of Minnesota Medical School	86	85	1	1.2	6	85	84	1	1.2	6	1	1	0	0.0	1	76	76	0	0.0	3	32
Univ. of Md. School of Med. and Coll. of P. & S.	79	77	2	2.5	17	74	72	2	2.7	16	5	5	0	0.0	4	52	52	0	0.0	10	24
Meharry Medical College	78	49	29	37.2	15	57	42	15	26.3	12	21	7	14	66.7	7	32	31	1	15.6	7	61
Emory University Medical College	76	74	2	2.6	8	71	69	2	2.8	7	5	5	0	0.0	3	63	62	1	1.6	6	10
St. Louis College of Physicians and Surgeons	62	24	38	61.3	13	57	24	33	22.8	11	5	0	5	100.0	3	28	14	14	50.0	7	35
University of Illinois College of Medicine	61	60	1	1.6	10	55	54	1	1.8	6	6	6	0	0.0	5	55	54	1	1.8	6	17
University of Cincinnati College of Medicine	59	58	1	1.7	7	59	58	1	1.7	7	0	0	0	0.0	0	46	46	0	0.0	3	50
Washington University Medical School	57	56	1	1.8	13	52	52	0	0.0	10	5	4	1	20.0	4	36	36	0	0.0	5	37
Middlesex College of Medicine and Surgery	56	40	16	28.6	2	56	40	16	28.6	2	0	0	0	0.0	0	27	20	7	25.9	2	28
Hahnemann Med. Coll. and Hosp., Philadelphia	54	43	11	20.4	6	52	41	11	21.1	6	2	2	0	0.0	2	1	1	0	0.0	1	54
St. Louis University School of Medicine	51	50	1	2.0	10	46	45	1	2.2	9	5	5	0	0.0	3	36	36	0	0.0	7	36
Totals	1968	1826	142	7.2	....	1819	1714	105	5.8	....	149	112	37	24.8	....	1166	1130	37	3.2		

This table is interesting, since it gives data relating to the 22 medical colleges having over fifty graduates examined arranged according to the number. This allows of comparison between colleges having classes of nearly equal size. Rush Medical College had the largest number of graduates examined last year. The position was held by Jefferson Medical College from 1919 to 1921; by the Chicago College of Medicine and Surgery from 1913 to 1918, inclusive, by the University of Illinois College of Medicine in 1912. The higher places from the standpoint of the numbers examined, however, do not always mean the higher rank from the standpoint of scholarship as evidenced by the percentages of failures. The four highest failure percentages are for St. Louis College of Physicians and Surgeons, 61.3; Meharry Medical College, 37.2; Middlesex College of Medicine and Surgery, 28.6, and Hahnemann Medical College and Hospital of Philadelphia, 20.4.

Of the 7 colleges having 100 or more examined, all this year have failure percentages of less than 10. Of the 15 colleges having between 50 and 100 graduates examined, eleven had failure percentages of less than 10, and four had over 20 per cent.

The average percentage of failures for these larger colleges for graduates of 1917 and previous years was 24.8; for graduates of 1918 to 1922, inclusive (recent graduates), 7.2; for graduates of 1922, 3.2, and for graduates of all years, 7.2. Of the 3,366 graduates of the 70 colleges in the United States which had graduates examined by the state boards in 1922, these larger colleges (31.4 per cent. of all schools having graduates) furnished 1,968, or 58.4 per cent., of the graduates examined.

TOTAL REGISTRATION IN 1922

The tables thus far described have referred only to the results of examinations and to those registered on that basis. Table G, however, shows the total number who received licenses in each state, including those registered by examination, by reciprocity and under various exemption clauses. Altogether 5,497 physicians were registered by all methods during 1922, as compared with 6,348 in 1921, 6,557 in 1920, 6,584 in 1919, and 4,185 in 1918. The total registered in 1918 —4,185—was the lowest number registered in any year since the publication of these statistics was begun, owing undoubtedly to the war. In 1919 the total increased by 2,399 and was the largest number since 1912. There has been a steady decrease each year since 1919. There has likewise been a decrease in reciprocal registrations since 1919.

Over 100 were registered by all methods in fourteen states; over 200 in eight; and over 300 in four, the largest numbers being 748 in New York; 630 in California; 335 in Illinois, and 313 in Pennsylvania. Of those licensed in California, 422, or 67 per cent., were registered by the endorsement of licenses granted in other states. Several boards examined and licensed osteopaths as physicians and surgeons. California registered 48; Massachusetts licensed 13; Colorado, 8, and Texas, 5. Altogether 74 osteopaths—graduates of colleges decidedly inferior to the lowest grade medical schools—were licensed as physicians and surgeons.

TABLE F.—*Physicians Examined by State Boards 1918 to 1922, Inclusive*

STATES	1918		1919		1920		1921		1922		Totals			
	Registered	Rejected	Registered	Rejected	Registered	Rejected	Registered	Rejected	Registered	Rejected	Examined	Registered	Rejected	Percentage Rejected
Alabama	20	0	23	12	34	2	37	3	31	1	172	145	27	15.7
Arizona	33	8	48	5	33	14	6	10	7	2	166	127	39	23.5
Arkansas	68	4	70	7	48	28	46	6	30	1	308	262	46	14.9
California	203	71	109	56	150	34	184	56	208	67	1,138	854	284	24.9
Colorado	44	10	57	16	56	46	44	16	32	34	355	233	122	34.4
Connecticut	39	14	94	24	97	26	145	27	114	26	606	489	117	19.3
Delaware	10	1	19	1	6	3	8	0	17	0	65	60	5	7.7
Dist. of Columbia	37	4	51	6	61	5	42	11	54	7	278	245	33	11.9
Florida	21	8	64	17	72	18	50	24	56	21	351	263	88	25.1
Georgia	48	2	60	5	70	6	68	0	68	1	328	314	14	4.2
Idaho	16	0	31	0	27	2	14	0	11	0	101	99	2	2.0
Illinois	367	57	475	96	404	66	348	61	286	68	2,228	1,880	348	15.6
Indiana	43	6	34	0	64	0	65	0	35	1	248	241	7	2.8
Iowa	50	1	78	4	76	2	61	0	49	0	321	314	7	2.2
Kansas	20	0	32	2	32	2	46	1	28	5	169	158	11	6.5
Kentucky	40	2	31	7	30	4	54	5	37	4	214	192	22	10.3
Louisiana	50	6	80	6	81	2	74	7	55	4	365	340	25	6.8
Maine	27	3	43	3	24	1	35	2	28	0	166	157	9	5.4
Maryland	54	5	145	11	107	11	123	7	74	3	540	503	37	6.9
Massachusetts	228	18	305	41	217	69	225	93	244	56	1,496	1,219	277	18.4
Michigan	97	4	52	0	161	2	176	2	119	4	617	605	12	1.9
Minnesota	68	0	98	0	90	4	120	1	107	3	491	483	8	1.6
Mississippi	12	0	18	3	30	1	15	2	27	2	110	102	8	1.8
Missouri	143	21	136	1	117	5	132	12	107	16	690	635	55	8.0
Montana	20	7	26	12	25	3	17	2	11	2	125	99	26	20.8
Nebraska	44	1	102	5	27	0	76	3	42	0	300	291	9	3.0
Nevada	5	1	13	0	14	2	3	1	13	1	53	48	5	9.4
New Hampshire	4	2	5	0	6	1	4	1	12	0	35	31	4	11.4
New Jersey	16	1	61	1	38	1	26	3	25	10	182	166	16	8.8
New Mexico	2	0	2	0	3	0	1	0	0	0	8	8	0	0.0
New York	456	117	627	189	703	246	806	128	599	80	3,961	3,191	760	19.2
North Carolina	49	3	59	9	70	3	51	4	37	8	293	266	27	9.2
North Dakota	6	3	6	4	13	3	6	5	6	2	54	37	17	31.5
Ohio	142	6	156	8	179	5	207	14	183	6	906	867	39	4.3
Oklahoma	24	0	34	0	14	0	38	1	20	2	133	130	3	2.3
Oregon	35	7	39	3	61	19	31	12	23	7	237	189	48	20.3
Pennsylvania	168	22	213	28	288	41	303	34	265	18	1,380	1,237	143	10.4
Rhode Island	13	4	20	5	25	5	27	1	27	0	127	112	15	11.8
South Carolina	17	12	45	14	33	8	28	2	24	1	184	147	37	20.1
South Dakota	14	0	20	1	38	2	19	1	19	0	114	110	4	3.5
Tennessee	103	19	96	7	82	0	102	0	65	1	475	448	27	5.7
Texas	82	2	89	3	103	0	77	1	77	0	434	428	6	1.4
Utah	10	1	29	0	18	1	17	1	11	3	91	85	6	6.6
Vermont	24	0	22	0	18	0	31	0	19	0	114	114	0	0.0
Virginia	50	6	65	12	55	4	61	4	55	0	312	286	26	8.3
Washington	59	7	63	10	24	5	20	7	6	6	207	172	35	16.9
West Virginia	16	4	35	15	41	10	37	11	42	9	220	171	49	22.3
Wisconsin	34	2	34	0	46	1	59	6	60	3	245	233	12	5.3
Wyoming	22	2	19	8	9	0	4	1	8	3	76	62	14	18.4
U.S. Territories and Possessions	1	0	27	18	33	21	42	7	28	4	181	131	50	27.6
Totals	3,637		4,736		4,787		4,807		3,993		21,960			
Registered	3,154		4,060		4,053		4,211		3,501		18,979			
Rejected	483		676		734		596		492		2,981			
Per Cent. Rejected	13.2		14.3		15.4		12.4		12.3		13.5			

This table gives the number of physicians who passed and failed in the examinations in each state during the last five years. The last four columns give the totals and the percentage rejected by each state.

Four states registered over 1,000 candidates by examination in the last five years, these being New York, Illinois, Pennsylvania and Massachusetts. Altogether 21,960 physicians were registered by examination in the five years with an average of 4,392 each year.

The five states having the highest percentages of failures in the five years were Colorado, 34.4; North Dakota, 31.5; Florida, 25.1; California, 24.9, and Arizona, 23.5. California and Colorado admit osteopaths to their examinations for physicians and surgeons and would be expected to have high percentages rejected. On the other hand, in many states, boards refuse to recognize low-grade colleges (see Table D) and thereby eliminate many inferior candidates prior to the examination, as a result, the percentages of failures at examinations in these states are lower than otherwise they would be. For example, Ohio rejected only 4 per cent. of those who took its examinations, but refused to admit graduates of eight inferior medical colleges to its examinations. The lowest failure percentages were in New Mexico, 0.0; Texas, 1.4; Minnesota, 1.6; Mississippi, 1.8; Michigan, 1.9.

TABLE G.—*Registration by State Boards During the Year 1922*

STATES	By Examination			By Reciprocity	Without Written Examination or Under Exemption	Total Registered
	Graduates, 1918-1922	Graduates, 1917 and Previous	Nongraduates and graduates of Nondescript Colleges			
Alabama	26	5	....	12	....	43
Arizona	5	2	....	30	....	37
Arkansas	21	9	....	36	....	66
California	167	9	32	422	....	6 0
Colorado	22	2	8	87	....	119
Connecticut	73	16	25	30	6	150
Delaware	17	0	....	5	....	22
District of Columbia	51	3	....	15	....	69
Florida	24	32	....	0	....	56
Georgia	68	0	....	16	....	84
Idaho	6	5	....	11	....	22
Illinois	275	11	....	49	....	335
Indiana	32	3	....	34	....	69
Iowa	48	1	....	21	....	70
Kansas	26	2	....	58	....	86
Kentucky	32	5	....	31	1	69
Louisiana	50	5	....	9	....	64
Maine	24	4	....	6	....	34
Maryland	70	4	....	19	....	93
Massachusetts	196	35	13	0	....	244
Michigan	112	7	....	83	....	202
Minnesota	90	8	....	93	....	200
Mississippi	24	2	1	16	....	43
Missouri	93	13	1	23	....	130
Montana	7	4	....	0	....	11
Nebraska	40	2	....	20	....	62
Nevada	8	5	....	11	....	24
New Hampshire	6	6	....	0	....	12
New Jersey	21	4	....	112	....	137
New Mexico	0	0	....	2	39	41
New York	538	61	....	143	6	748
North Carolina	37	0	....	29	....	66
North Dakota	4	2	....	8	....	14
Ohio	171	12	....	78	....	261
Oklahoma	16	4	....	58	....	78
Oregon	16	7	....	24	....	47
Pennsylvania	239	26	....	48	....	313
Rhode Island	20	7	....	0	....	27
South Carolina	18	6	....	6	....	30
South Dakota	13	6	....	3	....	22
Tennessee	58	7	....	0	....	65
Texas	71	4	2	101	....	178
Utah	11	0	....	16	....	27
Vermont	18	1	....	2	....	21
Virginia	52	3	....	25	....	80
Washington	5	1	....	53	....	59
West Virginia	40	2	....	40	....	82
Wisconsin	50	9	1	50	....	110
Wyoming	4	4	....	9	....	17
U. S. Terr. and Poss.	19	9	....	0	....	28
Totals	3043	375	83	1944	52	5497

This table shows the total number registered during 1922 in each state by examination, by reciprocity, and by the endorsement of credentials. The first three columns show those registered by examination, including recent graduates, older practitioners and nongraduates or graduates of nondescrips colleges—including also osteopaths who were granted licenses as physicians and surgeons. The fourth column shows the number licensed by the endorsement of licenses issued by other states (reciprocity) and of certificates of the National Board of Medical Examiners. The fifth column shows those licensed under various exemption clauses in the practice acts, such as because of high professional standing or (in New Mexico) by the endorsement of diplomas of recognized medical schools. California licensed as physicians 32 out of 66 graduates of osteopathic colleges who took the examination, and Colorado so licensed 7 out of 12 osteopaths.

The last column shows the total number of physicians registered by all methods in each state during 1922. Four states registered over 300 each, these being in New York, 748; California, 630; Illinois, 335, and Pennsylvania, 313. Twenty states registered less than fifty physicians each. The total registration by all methods was 5,497, a decrease of 851 below the total registration in 1921.

TABLE H.—*Registration by State Boards for Five Years*

STATE	1918	1919	1920	1921	1922	Totals
Alabama	26	55	54	51	43	229
Arizona	33	48	33	6	37	157
Arkansas	81	130	97	97	66	471
California	342	445	651	581	630	2,649
Colorado	97	141	138	123	119	618
Connecticut	46	107	108	164	150	575
Delaware	24	28	7	14	22	95
District of Columbia	41	66	77	57	69	310
Florida	21	64	72	50	56	263
Georgia	72	111	114	86	84	467
Idaho	31	49	41	33	22	176
Illinois	392	568	482	399	335	2,176
Indiana	58	65	158	102	69	452
Iowa	79	149	132	126	70	556
Kansas	56	89	96	99	86	426
Kentucky	54	68	51	94	69	336
Louisiana	57	98	93	85	64	397
Maine	32	51	30	41	34	188
Maryland	73	179	164	160	93	669
Massachusetts	228	305	217	225	244	1,219
Michigan	145	182	287	248	202	1,064
Minnesota	97	179	174	215	200	865
Mississippi	15	46	47	34	43	185
Missouri	186	232	177	165	130	890
Montana	20	26	26	19	11	102
Nebraska	77	167	75	111	62	492
Nevada	16	22	31	6	24	99
New Hampshire	7	18	21	18	12	76
New Jersey	101	263	171	164	137	836
New Mexico	33	50	46	38	41	208
New York	496	711	779	879	748	3,613
North Carolina	67	82	114	101	66	430
North Dakota	11	18	28	14	14	85
Ohio	175	285	311	326	261	1,358
Oklahoma	73	116	71	108	78	446
Oregon	35	39	65	31	47	217
Pennsylvania	172	269	316	334	313	1,404
Rhode Island	13	20	25	27	27	112
South Carolina	17	45	41	40	30	173
South Dakota	14	20	49	24	22	129
Tennessee	114	123	83	102	65	487
Texas	149	275	271	195	178	1,068
Utah	23	54	32	29	27	165
Vermont	25	24	20	34	21	124
Virginia	78	127	85	82	80	452
Washington	59	105	127	158	59	508
West Virginia	41	76	96	74	82	368
Wisconsin	54	148	106	119	110	537
Wyoming	28	19	34	18	17	116
U. S. Possessions	1	27	35	42	28	133
Totals	4,185	6,584	6,557	6,348	5,497	29,171

This table shows the totals registered in each state during the last five years. Increases over 1921 are noteworthy in California and Massachusetts—states where liberal licensure standards are in effect. Marked decreases are noteworthy in several states. Totals also are given for the entire five years. Eight states registered over a thousand physicians, the largest number being New York with 3,613, followed by California with 2,649, Illinois with 2,176, Pennsylvania with 1,404 and Ohio with 1,358. The lowest number registered during the five years was in New Hampshire, where only 76 physicians were registered, followed by North Dakota with 85 and Delaware with 95.

For the five years there were registered altogether 29,171 physicians with an average of 5,834 each year.

TABLE I.—*Character of Physicians Licensed in 1922*

Marginal Number	STATE	By Examination					By Reciprocity or Credentials					Totals Registered from Medical Colleges in Class				Grand Totals	Marginal Number
		Medical Colleges in Class				Totals	Medical Colleges in Class				Totals						
		A	B	C	Misc.		A	B	C	Misc.		A	B	C	Misc.		
1	Alabama	24	6	0	1	31	4	2	0	6	12	28	8	0	7	43	1
2	Arizona	6	0	0	1	7	10	2	1	17	30	16	2	1	18	37	2
3	Arkansas	7	6	17	0	30	17	9	1	9	36	24	15	18	9	66	3
4	California	127	38	34	9	208	222	36	29	135	422	349	74	63	144	630	4
5	Colorado	17	1	12	2	32	45	7	2	33	87	62	8	14	35	119	5
6	Connecticut	57	2	51	4	114	7	4	23	2	36	64	6	74	6	150	6
7	Delaware	11	2	3	1	17	5	0	0	0	5	16	2	3	1	22	7
8	District of Columbia	53	0	1	0	54	6	0	3	6	15	59	0	4	6	69	8
9	Florida	42	3	1	10	56	0	0	0	0	0	42	3	1	10	56	9
10	Georgia	66	2	0	0	68	9	1	0	6	16	75	3	0	6	84	10
11	Idaho	7	3	0	1	11	8	0	1	2	11	15	3	1	3	22	11
12	Illinois	255	17	10	4	286	33	6	0	10	49	288	23	10	14	335	12
13	Indiana	34	0	0	1	35	19	4	0	11	34	53	4	0	12	69	13
14	Iowa	45	1	0	3	49	19	1	0	1	21	64	2	0	4	70	14
15	Kansas	26	0	0	2	28	30	10	4	14	58	56	10	4	16	86	15
16	Kentucky	24	6	4	3	37	20	5	0	7	32	44	11	4	10	69	16
17	Louisiana	48	3	2	2	55	6	0	0	3	9	54	3	2	5	64	17
18	Maine	27	0	0	1	28	2	0	1	3	6	29	0	1	4	34	18
19	Maryland	69	1	1	3	74	12	1	0	6	19	81	2	1	9	93	19
20	Massachusetts	178	2	51	13	244	0	0	0	0	0	178	2	51	13	244	20
21	Michigan	112	4	0	3	119	49	3	3	28	83	161	7	3	31	202	21
22	Minnesota	102	2	0	3	107	76	4	0	13	93	178	6	0	16	200	22
23	Mississippi	18	6	3	0	27	7	2	0	7	16	25	8	3	7	43	23
24	Missouri	92	3	7	5	107	17	1	0	5	23	109	4	7	10	130	24
25	Montana	10	0	0	1	11	0	0	0	0	0	10	0	0	1	11	25
26	Nebraska	40	0	0	2	42	12	5	0	3	20	52	5	0	5	62	26
27	Nevada	2	0	5	6	13	3	3	0	5	11	5	3	5	11	24	27
28	New Hampshire	8	1	1	2	12	0	0	0	0	0	8	1	1	2	12	28
29	New Jersey	21	1	0	3	25	78	4	5	25	112	99	5	5	28	137	29
30	New Mexico	0	0	0	0	0	15	5	0	21	41	15	5	0	21	41	30
31	New York	537	40	3	19	599	93	13	2	41	149	630	53	5	60	748	31
32	North Carolina	37	0	0	0	37	15	4	0	10	29	52	4	0	10	66	32
33	North Dakota	4	0	0	2	6	6	0	0	2	8	10	0	0	4	14	33
34	Ohio	136	38	0	9	183	52	8	1	17	78	188	46	1	26	261	34
35	Oklahoma	10	5	2	3	20	22	10	4	22	58	32	15	6	25	78	35
36	Oregon	18	1	0	4	23	10	0	1	13	24	28	1	1	17	47	36
37	Pennsylvania	223	22	5	15	265	38	0	0	10	48	261	22	5	25	313	37
38	Rhode Island	22	0	0	5	27	0	0	0	0	0	22	0	0	5	27	38
39	South Carolina	20	1	0	3	24	4	1	0	1	6	24	2	0	4	30	39
40	South Dakota	13	2	0	4	19	2	0	0	1	3	15	2	0	5	22	40
41	Tennessee	35	26	2	2	65	0	0	0	0	0	35	26	2	2	65	41
42	Texas	67	4	2	4	77	41	18	6	36	101	108	22	8	40	178	42
43	Utah	11	0	0	0	11	13	1	0	2	16	24	1	0	2	27	43
44	Vermont	19	0	0	0	19	2	0	0	0	2	21	0	0	0	21	44
45	Virginia	53	0	1	1	55	17	4	1	3	25	70	4	2	4	80	45
46	Washington	6	0	0	0	6	32	7	0	14	53	38	7	0	14	59	46
47	West Virginia	37	1	3	1	42	29	4	1	6	40	66	5	4	7	82	47
48	Wisconsin	49	2	1	8	60	39	3	0	8	50	88	5	1	16	110	48
49	Wyoming	1	0	3	4	8	4	3	2	0	9	5	3	5	4	17	49
50	U.S. Territories and Possessions	23	1	0	4	28	0	0	0	0	0	23	1	0	4	28	50
	Totals	2,849	253	225	174	3,501	1,150	191	91	564	1,996	3,999	444	316	738	5,497	

Of the 18 Class C graduates licensed in Arkansas, 1 was registered by the Regular Board and 17 were registered by the Eclectic Board. The Arkansas Homeopathic Board reported no candidates licensed either by examination or by reciprocity.

Of the 63 graduates of Class C colleges licensed in California, 48 were graduates of osteopathic colleges—institutions not generally recognized as medical colleges by state licensing boards. In Colorado 8 graduates of osteopathic colleges were registered.

Of the 150 physicians licensed in Connecticut, the Regular Board registered 62 Class A and 4 miscellaneous graduates and the Homeopathic Board registered 1 Class A, 1 Class B, and 2 miscellaneous graduates, while the Eclectic Board registered 1 Class A, 4 Class B, and 75 Class C graduates.

Illinois harbors the Chicago Medical School, a Class C medical college; Massachusetts has two Class C colleges, the College of Physicians and Surgeons and the Middlesex College of Medicine and Surgery, and does not have authority to refuse recognition to low grade institutions. This accounts for the larger numbers of Class C graduates licensed in these states.

Texas does not recognize Class C medical colleges, but, nevertheless, accepts graduates of osteopathic schools which are, in fact, medical schools of a still lower grade.

Eight states accepted Class C graduates through reciprocity where they did not license any by examination. On the whole 225 Class C graduates were licensed by examination, and 91 through reciprocity, a total of 316.

TOTAL REGISTRATION IN FIVE YEARS

Table H permits the reader to compare the registrations in each state for the last five years. In 1918 there was a decrease of 1,238 below 1917—due undoubtedly to the war. There was an increase of 2,399 in 1919 and slight decreases in 1920 and 1921. The decrease in 1922 was 851.

The registrations in different states are interesting. In 1918, regardless of the general decrease in other states, Massachusetts had an increase. This increase was continued in 1919 and, during the three succeeding years had increases in spite of the general decrease. Since Massachusetts does not have reciprocal relations with other states, this increase is evidently due to the board's lack of authority to refuse recognition to low-grade medical colleges and to the fact that the board cannot insist on reasonable standards of preliminary and professional education. In California and Texas the large registrations were apparently due to the generous provisions for reciprocity and for the licensing of osteopaths. In 1920 California had 651 registrations, including 501 (76.9 per cent.) who were registered by reciprocity. In 1921 and 1922 this state still retained second place in the number of registrations.

During the last five years, New York registered 3,613, followed by California with 2,649; Illinois with 2,176; Pennsylvania with 1,404, and Ohio with 1,358. The four lowest registrations are New Hampshire with 76, North Dakota with 85, Delaware with 95, and Nevada with 99.

MEDICAL TRAINING OF APPLICANTS LICENSED IN 1922

Table I is of special interest, since it shows for each state the numbers of candidates coming from medical schools rated in classes A, B and C, thereby indicating the character of the medical training of the candidates licensed during 1922. Of the 5,497 candidates registered, 3,501 were licensed by examination and 1,996 by reciprocity or on presentation of acceptable credentials. Those who graduated prior to 1907, when the first classification of medical colleges was completed by the Council on Medical Education, are included among those graduating from "Miscellaneous Colleges." Among the graduates of Class C schools are included 74 graduates of osteopathic colleges who were licensed as physicians in California, Colorado, Massachusetts and Texas.

As will be noted, the largest number of Class C graduates were licensed in Connecticut, 74; followed by California with 63; Illinois with 45, and Massachusetts with 51. All but one of the Class C graduates registered in Arkansas were licensed by the Eclectic Board, and in Connecticut all of the Class C graduates were registered by the Eclectic Board. It is noteworthy also that of the 74 registered by the Eclectic Board, 30 were graduates of regular medical schools, and 18 were

TABLE J.—*Qualifications of Physicians Licensed by State Medical Boards in Six Years*

Mar. No.	STATE	Graduates of Class A Medical Schools							Graduates of Class B Medical Schools							Graduates of Class C Medical Schools							Grads. of Misc. Colleges 6 Yrs.	Total Registrations 6 Yrs.	Mar. No.
		1917	1918	1919	1920	1921	1922	Total	1917	1918	1919	1920	1921	1922	Total	1917	1918	1919	1920	1921	1922	Total			
1	Alabama	41	18	37	39	37	28	200	3	5	13	10	7	8	46	0	0	0	3	1	0	4	27	277	1
2	Arizona	23	11	13	21	4	16	88	3	4	10	3	0	2	22	0	1	2	0	0	1	4	75	189	2
3	Arkansas	27	12	31	36	47	24	177	34	32	34	16	9	15	140	26	26	33	26	21	18	150[1]	115	582	3
4	California	114	67	154	265	235	349	1,184	97	69	69	69	85	74	463	88	116	20	61	47	63	405[2]	1,037	2,589	4
5	Colorado	50	30	56	57	54	62	309	11	7	13	7	9	8	55	1	24	33	33	25	14	120[3]	234	818	5
6	Connecticut	61	37	89	93	69	64	413	9	4	7	4	7	6	27	5	1	2	1	66	74	149[4]	60	559	6
7	Delaware	12	13	21	3	10	16	75	3	4	6	3	1	2	19	0	2	0	1	2	3	8	10	112	7
8	Dist. Columbia	23	37	55	66	45	59	285	4	1	2	4	0	0	11	2	0	2	1	1	4	10	37	343	8
9	Florida	30	3	31	33	28	42	167	4	2	5	5	5	3	24	0	0	3	3	1	1	8	108	307	9
10	Georgia	91	46	80	76	72	75	440	19	11	18	25	6	3	82	0	1	1	1	2	0	5	62	589	10
11	Idaho	15	11	25	31	12	15	109	2	1	5	2	5	3	18	1	2	2	0	0	1	6	68	201	11
12	Illinois	191	199	376	370	320	288	1,744	273	161	129	54	21	23	661	40	11	38	33	45	10	177[5]	114	2,696	12
13	Indiana	50	45	41	103	81	53	373	13	7	10	27	10	4	71	0	0	2	2	0	0	4	83	531	13
14	Iowa	60	48	104	103	97	64	476	20	13	19	15	15	2	84	1	5	4	2	6	0	18	69	647	14
15	Kansas	31	29	53	62	71	56	302	4	9	17	10	7	10	57	4	4	6	2	4	4	24	109	493	15
16	Kentucky	50	26	40	35	63	44	258	23	18	11	8	10	11	81	0	5	4	3	5	4	21	52	412	16
17	Louisiana	44	45	81	82	74	54	380	5	4	9	6	3	3	30	0	0	1	0	1	2	4	34	448	17
18	Maine	34	24	39	23	32	29	181	1	1	1	0	2	0	5	1	0	0	0	0	1	2	42	230	18
19	Maryland	85	57	154	130	140	81	647	4	3	11	3	10	2	33	2	2	4	3	4	1	16	73	769	19
20	Massachusetts	202	188	243	184	153	178	1,148	6	8	14	9	4	2	43	6	9	19	19	42	51	146[5]	100	1,438	20
21	Michigan	150	118	122	215	195	161	961	18	3	19	24	26	7	97	1	1	0	1	2	3	8	196	1,262	21
22	Minnesota	86	82	140	146	190	178	812	3	5	16	14	7	6	51	0	0	1	1	0	0	2	90	968	22
23	Mississippi	17	12	32	34	27	25	147	9	0	6	4	4	8	31	1	0	1	1	0	3	6	38	222	23
24	Missouri	101	85	159	127	136	109	717	27	26	25	32	14	4	128	61	52	11	5	5	7	141[6]	110	1,096	24
25	Montana	28	7	15	18	14	10	92	7	4	5	2	0	0	18	0	0	1	1	0	0	2	33	145	25
26	Nebraska	62	55	119	44	82	52	414	7	7	22	17	12	5	70	8	0	7	2	5	0	22	85	591	26
27	Nevada	8	3	7	10	1	5	34	2	3	2	2	0	3	12	2	0	5	6	0	5	18	60	123	27
28	New Hampshire	12	3	14	17	10	8	64	0	0	0	0	1	1	2	0	1	1	0	1	1	4	24	94	28
29	New Jersey	82	63	187	111	113	99	645	13	6	22	11	15	5	72	1	1	0	7	1	5	15	226	958	29
30	New Mexico	28	10	17	14	20	15	104	4	4	11	7	3	5	34	1	0	1	0	0	0	2	135	275	30
31	New York	530	417	600	675	758	630	3,610	57	44	66	55	73	53	348	17	7	3	0	1	5	33	257	4,248	31
32	North Carolina	55	46	67	91	76	52	387	19	6	5	12	5	4	51	1	1	1	2	1	0	6	72	516	32
33	North Dakota	16	3	11	23	10	10	73	4	1	4	3	0	0	12	0	0	0	0	0	0	0	24	109	33
34	Ohio	170	120	194	228	189	188	1,089	43	33	51	44	84	46	301	1	1	1	0	3	1	7	205	1,603	34
35	Oklahoma	35	10	28	35	50	32	190	52	26	45	13	10	15	161	6	5	5	5	26	6	53	184	588	35
36	Oregon	23	18	27	41	19	28	156	2	4	0	6	1	1	14	4	0	2	3	2	1	12	72	254	36
37	Pennsylvania	224	157	239	289	289	261	1,459	24	7	18	16	16	22	103	0	0	1	1	14	5	21	79	1,662	37
38	Rhode Island	19	10	14	20	15	22	100	0	1	2	1	1	0	5	0	1	1	1	1	0	4	25	134	38
39	South Carolina	31	16	42	36	31	24	180	3	0	3	1	2	2	11	0	0	0	1	3	0	4	15	210	39
40	South Dakota	21	9	8	33	17	15	103	2	2	2	3	2	2	13	0	1	1	2	1	0	5	32	154	40
41	Tennessee	95	40	69	54	69	35	362	63	58	25	24	30	26	226	6	14	23	2	0	2	47	19	654	41
42	Texas	101	71	156	159	116	108	711	38	30	38	16	18	22	162	5	81	16	28	34	8	112[7]	259	1,244	42
43	Utah	15	14	35	24	21	24	133	3	2	6	0	1	1	13	0	1	3	2	4	0	10	29	185	43
44	Vermont	11	24	20	20	29	21	125	1	0	2	0	0	0	3	0	0	0	0	0	0	0	9	137	44
45	Virginia	72	54	102	70	75	70	443	4	7	8	7	2	4	32	1	3	0	1	2	2	9	50	534	45
46	Washington	35	26	49	60	73	38	281	8	9	13	8	19	7	64	1	10	9	8	2	0	25	195	565	46
47	West Virginia	52	15	47	71	48	66	299	14	13	15	10	8	5	65	1	0	1	3	1	4	10	78	452	47
48	Wisconsin	44	27	97	78	87	88	421	17	9	21	13	12	5	77	0	0	2	1	9	1	13	77	604	48
49	Wyoming	11	2	12	17	10	5	57	5	8	11	6	1	3	34	2	12	5	1	1	5	26	42	143	49
50	U.S. Territories and Possessions	1	0	16	25	31	23	96	1	0	6		2	1	10	0	0	0	1	2	0	3	26	135	50
	Totals	3,369	2,456	4,368	4,597	4,445	3,999	23,234	988	682	872	631	585	444	4,202	297	342	278	275	394	316	1,902	5,256	34,594	

1. Of the 150 graduates of low grade colleges licensed in Arkansas during the last five years, 147 were licensed by the eclectic board of medical examiners and only 2 by the regular board.
2. During the five years, 342 graduates of low grade colleges were licensed in California, including 248 osteopaths who were licensed as physicians.
3. Of the 106 Class C graduates licensed in Colorado, 73 were osteopaths who were licensed with the same privileges as physicians.
4. During the last two years the Connecticut eclectic board has registered 145 graduates of Class C colleges, or those for whom no evidence of their having graduated anywhere has been received.
5. Illinois and Massachusetts are the homes of Class C medical colleges, which accounts for the large number of Class C graduates licensed each year.
6. Although Missouri has three Class C medical colleges in the state, it is noteworthy that the numbers licensed have decidedly decreased since 1918.
7. Of the 112 graduates of low grade institutions licensed in Texas during the five years, only 14 were licensed by examination, while 98 were licensed by reciprocity. Of those licensed, 45 were osteopaths who were licensed with full privileges as physicians.

TABLE K.—*Physicians Registered Through Reciprocity by State Examining Boards During 1922*

Number		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53
	Total Regis. by Recip. Ea. State	Alabama	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	Dist. Columbia	Florida	Georgia	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine	Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	U.S.A., U.S.N., etc	Nat. Bd. Med. Ex.	U.S. Territories	Foreign
Alabama	12	..	..	..	..	..	..	..	..	..	3	..	..	..	..	..	3	..	..	..	..	..	..	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..	..	..	..	..	..	..	..	..	..	..
Arizona	30	1	..	..	1	1	..	..	2	..	..	..	1	1	2	..	..	1	..	..	..	1	..	..	3	..	..	..	..	..	..	2	..	..	..	..	..	1	..	..	..	..	2	3	1	..	1	..	1	..	..	..	..	4
Arkansas	36	1	..	..	..	..	..	1	..	2	..	..	2	1	..	1	1	1	..	..	1	6	..	..	5	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7	4	..	..	..	..	..	..	..	..	..	..
California	422	..	10	3	..	9	2	..	3	..	3	4	53	10	21	11	2	2	3	4	7	15	12	..	21	8	16	5	..	5	..	24	..	7	15	5	20	16	..	3	5	7	6	8	2	1	28	4	9	1	28	..	4	..
Colorado	87	1	..	2	1	..	..	..	..	..	..	..	16	1	4	5	2	1	..	1	3	3	1	2	15	..	5	..	..	..	1	6	..	1	2	2	..	1	..	..	..	3	1	..	..	1	..	1	2	2	1	..	..
Connecticut	30	..	..	13	..	..	..	..	..	..	2	..	1	..	1	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	5	1	..	..	..	..	..	1	..	..	..	2	..	1	1	..	..	..	..	..	..	..
Delaware	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..
Dist. of Col.	15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	2	..	1	1	2	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	2	1	..	..	2	..	1	..	..	..	..	..
Georgia	16	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..	3	1	1	1	..	..	..	..	..	..	2	..	..	1	..	..	..	..	..	..	..	..	..	2	..	..	2	..	..	..	..	..	..	..
Idaho	11	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	4	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	2	..	..	..	1	..	..	..	..	..	..	..	..
Illinois	49	..	..	..	..	..	..	..	..	..	..	..	..	2	3	1	1	1	..	3	..	2	..	1	14	..	2	..	..	1	..	1	..	1	4	..	..	4	..	..	..	..	..	1	..	1	..	..	4	1	1	..	..
Indiana	34	..	..	1	1	..	..	..	1	..	1	..	8	..	..	..	6	..	1	1	..	2	1	..	..	..	..	..	..	..	..	2	..	..	4	..	..	..	..	..	..	3	..	..	..	2	..	..	..	..	..	..	..
Iowa	21	..	..	..	..	..	1	..	..	..	..	..	3	..	..	..	..	..	1	..	..	3	..	..	4	..	4	..	..	..	..	..	..	..	2	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..	..
Kansas	58	1	..	1	..	1	..	1	..	..	1	..	14	1	3	..	1	1	..	2	..	..	1	1	14	..	6	..	..	..	..	..	1	1	3	..	..	..	..	..	..	2	1	..	..	..	..	1	..	1	..	..	..
Kentucky	31	..	..	..	..	..	..	1	..	..	..	..	3	3	1	..	..	..	..	2	1	..	2	1	..	..	..	..	..	..	..	1	..	..	3	..	..	..	..	..	..	12	..	..	..	..	..	..	..	..	..	..	1
Louisiana	9	1	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	1	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Maine	6	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..
Maryland	19	..	..	..	1	..	..	1	2	..	..	..	1	..	1	..	..	1	..	..	..	1	..	..	1	..	..	..	..	2	..	1	1	..	2	..	..	..	1	..	..	1	..	..	..	1	..	2	..	..	..	..	..
Michigan	83	..	1	1	..	..	1	1	1	..	3	..	21	4	4	..	2	2	1	5	4	..	2	..	7	..	2	..	..	..	..	6	..	2	5	1	..	1	..	..	..	1	1	1	1	..	..	1	..	..	..	..
Minnesota	93	..	..	..	4	..	..	..	4	..	..	..	18	3	12	..	..	3	1	5	..	6	..	..	5	..	4	..	..	1	..	..	..	3	5	..	..	4	..	..	3	..	..	1	..	1	..	..	1	3	..	..	6	..	..
Mississippi	16	2	..	2	..	..	..	..	..	..	1	..	..	..	..	..	1	4	..	..	1	..	1	..	..	..	..	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..
Missouri	23	1	..	..	..	1	..	..	..	..	1	..	7	4	1	3	2	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Nebraska	20	..	..	..	..	..	..	..	..	..	..	..	7	..	2	2	..	..	..	..	1	..	2	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	2	..	..	..	2	..	..	..	..	..	..
Nevada	11	..	..	..	4	..	..	..	..	..	..	1	1	..	..	..	..	..	1	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..	..	..	..	1	..	..	..	..	..
New Jersey	112	..	..	..	..	..	2	4	1	..	1	..	1	..	1	..	1	..	..	6	..	2	..	..	1	..	..	..	..	..	..	56	2	..	..	1	..	20	..	1	..	2	1	..	4	..	..	3	..	..	..	2	..	..
New Mexico	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
New York	143	2	..	..	7	..	5	4	3	..	2	..	18	5	..	..	2	..	2	2	13	6	2	..	5	..	1	..	1	4	..	..	..	..	12	..	1	13	4	..	..	2	..	2	3	15	1	..	3	..	..	..	..	3
No. Carolina	29	..	..	..	..	..	..	..	..	..	5	..	..	1	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	1	..	1	..	..	1	1	..	1	1	9	..	1	..	..	..	4	..	..	..	..	1	..	..
No. Dakota	8	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	1	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Ohio	78	2	..	1	1	1	..	..	2	..	..	..	9	2	..	1	5	..	..	..	4	..	13	..	2	8	..	2	..	..	..	8	..	..	..	..	..	10	..	..	..	..	2	..	1	2	2	..	..	..	..	..
Oklahoma	58	..	..	11	1	..	..	..	1	..	2	..	1	2	2	4	2	1	..	..	1	..	..	1	7	..	5	..	..	..	1	1	..	..	..	..	..	1	..	..	..	..	6	3	1	..	1	..	1	1	..	..
Oregon	24	..	..	..	2	..	..	..	..	2	..	..	5	..	2	1	..	..	..	..	1	1	..	..	..	..	4	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..	1	..	..	..	3	..	..	..	..	..
Penns'vania	48	..	..	..	..	1	..	..	3	..	1	..	..	1	2	..	..	..	3	7	..	5	..	..	..	..	..	..	..	1	5	..	2	1	..	1	..	..	..	5	..	..	..	..	..	3	..	1	..	3	3	..	..
So. Carolina	6	1	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
So. Dakota	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..
Texas	101	1	1	7	1	1	..	..	..	..	1	..	14	..	1	6	5	10	..	2	4	1	1	2	6	..	1	..	..	1	1	4	..	..	2	9	1	2	..	1	..	9	..	1	..	1	..	2	..	..	..	..	1
Utah	16	..	..	..	1	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	3	..	..	..	..	..	..	3	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	1	..	..	4	..	..
Vermont	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..
Virginia	25	1	..	..	..	..	..	1	1	..	..	..	1	..	..	..	..	1	..	5	..	..	..	..	..	..	..	..	..	..	..	1	2	..	3	1	..	2	..	2	..	2	..	..	..	..	..	2	..	..	..	..	..
Washington	53	1	..	..	1	..	..	..	..	..	..	3	12	..	2	3	1	..	..	1	..	1	..	..	..	11	3	..	..	..	..	..	..	2	3	..	2	1	..	..	..	1	..	..	..	..	..	1	..	..	..	2	2
W. Virginia	40	1	..	..	..	..	1	..	..	..	2	..	1	2	..	..	2	1	..	5	..	1	..	..	1	..	..	..	..	1	..	1	..	..	3	..	..	5	..	2	..	1	..	..	..	9	..	..	..	..	..	1	..
Wisconsin	50	..	..	1	..	..	..	..	..	..	..	..	22	..	..	1	1	..	..	..	..	3	4	..	2	..	..	..	..	2	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	13	..	..	..
Wyoming	9	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	1	1	1	..	..	..	1	..	..	..	..
Totals	1944	19	12	43	28	15	11	12	27	1	34	10	246	44	65	41	40	33	14	64	38	70	40	24	126	23	57	5	7	25	3	127	8	18	70	27	26	90	6	24	9	75	34	17	13	46	37	24	27	4	52	13	8	10
Number		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53

This table shows the number of physicians registered by each state through reciprocity during 1922. Read from left to right, it shows the total number of physicians registered through reciprocity in the state named and the number of such candidates coming from each of the states named at the top of the various columns. Read from above downward, the figures show the number of physicians who left the state named at the head of the column and went to each of the states named in the corresponding lines, and at the bottom the total number of candidates leaving the state to go elsewhere. For example, read from left to right the table shows that North Dakota registered 8 candidates through reciprocity in 1922 and that of these candidates 1 each came from Illinois, Indiana and Michigan, and 5 from Minnesota. Read from above downward the table shows that 18 physicians went from North Dakota, and of these 7 went to California, 1 each went to Colorado, Illinois, Kansas, and Oregon, 2 each to Michigan and Washington, and 3 to Minnesota. The line at the bottom shows in what states physicians who registered through reciprocity obtained their original licenses. The total number licensed by reciprocity was 1,944, or 246 less than in 1921. This total includes 20 osteopaths, 16 in California, 1 in Colorado, and 3 in Texas, who were granted full privileges as physicians and surgeons.

TABLE L.—*Reciprocal Registration in Five Years (Showing What States Issued Original Licenses)*

STATE	Physicians Going from States Named During					Totals
	1918	1919	1920	1921	1922	
Alabama	12	27	32	31	19	121
Arizona	4	7	6	8	12	37
Arkansas	24	72	58	33	43	230
California	5	14	23	23	28	93
Colorado	10	22	13	18	15	78
Connecticut	2	12	9	10	11	44
Delaware	11	8	6	10	12	47
District of Columbia	14	30	37	20	27	128
Florida	2	2	3	4	1	12
Georgia	10	38	47	40	34	169
Idaho	0	7	11	14	10	42
Illinois	125	325	367	304	246	1367
Indiana	30	57	52	50	44	233
Iowa	40	71	88	81	65	345
Kansas	28	75	65	54	41	263
Kentucky	31	71	68	56	40	266
Louisiana	5	36	43	40	33	157
Maine	8	18	16	26	14	82
Maryland	25	61	62	63	64	275
Massachusetts	10	36	59	31	28	174
Michigan	24	69	58	70	70	291
Minnesota	20	27	66	47	40	200
Mississippi	11	48	17	24	24	124
Missouri	65	144	143	158	126	636
Montana	1	8	17	41	23	90
Nebraska	36	60	71	48	57	272
Nevada	7	8	9	5	5	34
New Hampshire	4	24	5	10	7	50
New Jersey	15	30	27	15	25	112
New Mexico	6	9	3	3	3	24
New York	74	197	163	135	127	696
North Carolina	16	24	15	21	8	84
North Dakota	4	17	25	15	18	79
Ohio	27	73	98	58	70	326
Oklahoma	28	53	26	27	27	161
Oregon	7	15	18	6	26	72
Pennsylvania	57	113	123	92	90	475
Rhode Island	1	4	1	3	6	15
South Carolina	4	5	11	10	24	54
South Dakota	6	3	15	11	9	44
Tennessee	34	124	102	91	75	426
Texas	23	38	33	43	34	171
Utah	6	17	22	21	17	83
Vermont	7	25	18	11	13	74
Virginia	36	61	59	52	46	254
Washington	12	21	23	27	37	120
West Virginia	16	41	41	18	24	140
Wisconsin	13	51	35	30	27	156
Wyoming	4	6	7	8	4	29
Army, Navy, P. H. Service	10	130	108	61	52	361
National Board of Medical Examiners	1	19	18	23	15	76
U. S. Territories and Possessions	1	4	8	2	8	23
Foreign and Misc.	0	2	8	8	10	28
Totals	972	2459	2458	2110	1944	9943

This table shows that 9,943 candidates were registered through reciprocity during the last five years. In 1918 there was a marked decrease due largely to the war. In 1919 there was an increase of 1,487 due to a large migration of physicians following the return from military service, and in 1920 this large number was continued. In 1921, there was a reduction of 349, and in 1922 there was a further reduction of 166. I will be noted that 130 were registered in 1919 on the basis of military service, the numbers since being 108 in 1920, 61 in 1921, and 52 in 1922. A study of the totals for the different states shows that of the 9,943 registered during the five years, 1,367 obtained their original licenses in Illinois. New York could easily lead Illinois but reciprocal relations have been established with only nine other states where Illinois has such relations with twenty-nine.

registered for whom it is doubtful whether they graduated anywhere.

California registered 74 Class B graduates, the largest number, followed by New York with 53, and Ohio with 46. Only Class A graduates were registered either by examination or by reciprocity in Montana, North Dakota, Rhode Island and Vermont.

Source of Candidates Registered in Six Years

Of the 5,497 physicians registered by all methods in 1922, 3,999, or 72.8 per cent., graduated from Class A medical colleges; 444, or 8.1 per cent., from Class B medical colleges; 316, or 5.7 per cent., from Class C medical colleges, and 738, or 13.4 per cent., graduated prior to 1907, when the first classification of medical colleges was prepared or came from foreign medical colleges. By comparing these figures with the results for the previous five years as shown in Table 3, it is noteworthy that the percentages from Class B and Class C colleges are steadily decreasing and that the percentage of graduates of Class A colleges are increasing notwithstanding the fact that in a few states osteopaths are being licensed as physicians and surgeons.

Table 3.—*Source of Physicians Licensed in Six Years*

Year	Medical Colleges in						Miscellaneous and Foreign		Total
	Class A		Class B		Class C				
	Number	Per Cent.	Number	Per Cent.	Number	Per Cent.	Number	Per Cent.	
1917	3,369	62.1	988	18.2	297	4.3	769	14.4	5,423
1918	2,456	58.7	682	16.3	342	8.2	705	16.8	4,185
1919	4,368	66.4	872	13.2	278	4.2	1,066	16.2	6,584
1920	4,597	70.2	631	9.6	275	4.2	1,054	16.0	6,557
1921	4,445	70.0	585	9.2	394	6.2	924	14.6	6,348
1922	3,999	72.8	444	8.1	316	5.7	738	13.4	5,497
Totals	23,234	64.3	4,202	12.1	1,902	5.5	5,256	15.2	34,594

Training of Physicians Registered in Six Years

Table J is added this year and shows the character of the training of physicians registered during the last 6 years. It is noteworthy that of the 34,549 physicians registered in the six years, 23,234, or 64.3 per cent., were graduates of Class A medical schools, 4,202, or 12.1 per cent., were graduates of Class B schools, and 1,902, or 5.5 per cent., were graduates of Class C schools. Graduates of foreign medical schools and others who graduated prior to 1907 from schools which have not always since been rated in Class A have been grouped under "Miscellaneous Graduates," and during the six years there were 5,256 of these graduates registered.

It is noteworthy that the largest number of candidates who graduated from Class C schools or osteopathic colleges was 405 in California, the next highest numbers being 177 in Illinois, 150 in Arkansas, 149 in Connecticut, 146 in Massachusetts, 141 in Missouri, and 112 in Texas.

Registration by Reciprocity

Table K gives those registered without examination on presentation of satisfactory credentials, which included a license issued by some other state or by the National Board of Medical Examiners. Some state boards—Arizona, California, Colorado, Delaware, Maryland, New Hampshire, New Jersey and North Carolina, as examples—accept a physician's credentials, if satisfactory, whether or not the state board issuing the original license returns the favor. Had not reciprocal relations been established by the forty states shown in this Table, 1,944 physicians—many of whom had been in practice for ten or more years—would have been compelled to undergo the ordeal of a second trying examination.

Table L shows in what states were granted the original licenses of those who were registered elsewhere under the reciprocity provision during the last five years. Of the 9,943 physicians licensed through reciprocity during the last five years, the largest number coming from any one state was 1,367 who obtained their original licenses in Illinois. Although New York has a larger number of medical college graduates each year than Illinois,[3] only 696 physicians obtained original licenses in New York and registered elsewhere through reciprocity in the last five years. This is accounted for by the fact that Illinois has reciprocal relations with twenty-nine states, while New York has relations with only nine.

Improved Standards of Licensure

Table M shows the states which have adopted one or two years of college work as a minimum standard of preliminary education for those who seek the license to practice medicine in those states. The first and third columns show, respectively, when the one year and the two years of premedical college work affects students matriculating in medical colleges, and the second and fourth columns give the years in and after which all applicants for licenses are affected by the increased requirements. This table shows the rapidity with which requirements of preliminary education have been

Table M.—*State Requirements of Preliminary Education*

There are now forty-two states (counting Alaska Ter.) which have adopted requirements of preliminary education in addition to a standard four-year high school education. Of this number 38 now require the two year standard. These states, the number of college years required and the time the higher requirements became or become effective are as follows:

State Examining Board of	One Year of College Work		Two Years of College Work	
	Affects Students Matriculating	Affects All Graduates	Affects Students Matriculating	Affects All Graduates
Alabama	.....	....	1915-16	1919
Alaska	1914-15	1918	1918-19	1922
Arizona	1914-15	1918	1918-19	1922
Arkansas [1]	1915-16	1919	1918-19	1922
California	1915-16	1919	.....	....
Colorado	1908-09	1912	1910-11	1914
Connecticut	1911-12	1915	.....	....
Delaware*	.....	....	.....	....
District of Columbia†	.....	....	.....	....
Florida	1914-15	1918	1918-19	1922
Georgia	.....	....	1918-19	1922
Idaho	.....	....	1915-16	1919
Illinois	1915-16	1919	1918-19	1922
Indiana	1910-11	1914	1911-12	1915
Iowa	.....	....	1911-12	1915
Kansas	1910-11	1914	1918-19	1922
Kentucky	1914-15	1918	1918-19	1922
Louisiana	1915-16	1919	1918-19	1922
Maine	1915-16	1919	1916-17	1920
Maryland	1914-15	1918	1918-19	1922
Massachusetts†	.....	....	.....	....
Michigan	1914-15	1918	1918-19	1922
Minnesota	.....	....	1908-09	1912
Mississippi	1915-16	1919	1919-20	1923
Missouri*	.....	....	.....	....
Montana	1914-15	1918	1918-19	1922
Nebraska*	.....	....	.....	....
Nevada*	.....	....	.....	....
New Hampshire	1914-15	1918	1915-16	1919
New Jersey	1915-16	1919	1917-18	1921
New Mexico	1914-15	1918	1918-19	1922
New York	1917-18	1921	1918-19	1922
North Carolina	1914-15	1918	1918-19	1922
North Dakota	.....	....	1908-09	1912
Ohio*	.....	....	.....	....
Oklahoma	1914-15	1918	1917-18	1921
Oregon	.....	....	1920-21	1924
Pennsylvania	1914-15	1918	.....	....
Rhode Island	1914-15	1918	1918-19	1922
South Carolina	.....	....	1918-19	1922
South Dakota	1908-09	1912	1911-12	1915
Tennessee	1916-17	1920	1918-19	1922
Texas	1914-15	1918	.....	....
Utah	1913-14	1917	1922-23	1926
Vermont	1913-14	1917	1918-19	1922
Virginia	1914-15	1918	1917-18	1921
Washington	1914-15	1918	1918-19	1922
West Virginia	1917-18	1921	1920-21	1924
Wisconsin	.....	....	1915-16	1919
Wyoming†	.....	....	.....	....

* Require a four-year high school education or its equivalent.
† No fixed standard.
1. The higher standards in Arkansas are evidently not enforced by the sectarian licensing boards of that state.

3. J. A. M. A. 79: 637 (Aug. 19) 1922, Table 11.

advanced by state boards since 1908, prior to which no state was requiring more than a four year high school education. As will be noted, there are now forty-two states which have adopted the higher standard, and thirty-eight of these require as a minimum two years of premedical college work. It is understood that in every instance the one or two years of collegiate work must have included courses in physics, chemistry and biology. As shown in the footnotes, in the District of Columbia, Massachusetts and Wyoming no standards of preliminary education have been fixed.

In Table N the advance in standards of licensure is shown for all states since 1904. The most marked increase is in regard to the requirement of collegiate work in forty-two states—referred to in Table L. An equally great increase is

TABLE N.—*Advances in State License Requirements in Seventeen Years*

Requirement or Provision	States Having Provision for			States Still Having No Provision for
	1904	1922	Increase	
Preliminary Education—				
Any requirement	20	47	27	3[1]
A standard four-year high school education or higher	10	47	37	3[1]
One year or more of college work	0	42	42	8[2]
Two years of college work as a minimum	0	38	38	12[2]
That all applicants be graduates of a medical college	36	49	13	1[3]
That all applicants undergo an examination for license	45	50	5	0
Requirements of practical tests in the license examinations	1	13	12	37
Hospital intern year required	0	10[4]	10	40
Full authority by board to refuse recognition to low-grade colleges	14	47	33	3[5]
Boards refusing to recognize low-grade colleges	5	47[6]	42	3[7]
Reciprocal relations with other states	27	44	17	6[8]
Single boards of medical examiners	36	45	9	5[9]

1. District of Columbia, Massachusetts and Wyoming.
2. See Table M.
3. Colorado.
4. Pennsylvania, 1914; New Jersey, 1916; Alaska, 1917; Rhode Island, 1917; North Dakota, 1918; Washington, 1919; Illinois and Michigan, 1922; Iowa, 1923, and Texas, 1924.
5. District of Columbia, Massachusetts and Wyoming.
6. In two states, Arkansas and Connecticut, each of which has three separate boards, only the regular (nonsectarian) boards have refused recognition to low standard medical colleges and have enforced higher standards of preliminary education.
7. The states named in Footnote 5.
8. Alaska, Arizona, Connecticut (regular board), Florida, Massachusetts, Rhode Island. To this list should be added the outlying territories of Canal Zone, Philippine Islands and Porto Rico, which have no provision for reciprocity.
9. Multiple boards still remain in Arkansas, Connecticut, District of Columbia, Louisiana and Maryland.

in the number of states—now forty-seven—which are refusing to recognize low-grade medical colleges. Although, as shown in the third column, marked improvements have been made in state requirements for licensure, nevertheless, as indicated by the last column, there is still room for further improvement. The greatest needs are for a wider adoption of the requirement of the hospital intern year, the standard of two years of premedical college work, and—a matter of more vital importance—a more general and larger use of practical tests in the examinations. The states in which the boards are making really effective use of such examinations are Illinois, Massachusetts, Minnesota, North Dakota, Ohio and South Dakota. They are being followed to a certain extent in a few other states.

IN CONCLUSION

In the publication of these statistics, the endeavor has been to present the facts, a knowledge of which is always beneficial. We reiterate our acknowledgments to the state licensing boards for their ready cooperation and the complete reports which have been furnished. We believe the information here published will be of service not only to the medical colleges and the state boards, but also to the public.

National Board of Medical Examiners

The National Board of Medical Examiners, which was organized in 1915, consists of nineteen members, including the Surgeon-Generals of the Army, Navy and Public Health Service, and one other representative of each of those services, three representatives of the state medical licensing boards and six members appointed at large. Up to Dec. 31, 1921, eleven examinations have been held as follows:

Date of Examination	Where Held	Total Examined	Passed	Failed	Percentage Failed
Oct., 1916	Washington	10	5	5	50.0
June, 1917	Washington	12	9	3	33.3
Oct., 1917	Chicago	28	22	6	21.5
Jan., 1918	New York	20	18	2	10.0
Apr., 1918	Ft. Riley, Ft. Oglethorpe	23	18	5	26.1
Dec., 1918	Chicago, New York	16	15	1	6.3
June, 1919	Philadelphia	52	51	1	1.9
Feb., 1920	Chicago, St. Louis	48	36	12	25.0
May, 1920	Philadelphia	60	46	14	23.3
Feb., 1921	Rochester, Minn.	16	11	5	31.3
June, 1921	Boston	40	37	3	7.5
	Totals	325	268	57	14.4

Following completion of the examinations shown in the above table, those who were passed were granted the board's certificate. Since Jan. 1, 1922, however, the examinations have been divided in three parts as follows:

Part I, a written examination in the six fundamental medical sciences: Anatomy, including histology and embryology; physiology, physiologic chemistry; general pathology; bacteriology; materia medica and pharmacology. Part II, a written examination in: Medicine, including pediatrics, neuropsychiatry and therapeutics; surgery, including applied anatomy, surgical pathology and surgical specialties; obstetrics and gynecology; public health, including hygiene, and medical jurisprudence. Part III, a practical examination in each of the following four subjects: (*a*) Clinical medicine, including medical pathology, applied physiology, clinical chemistry, clinical microscopy and dermatology; (*b*) clinical surgery, including applied anatomy, surgical pathology, operative surgery and the surgical specialties of the diseases of the eye, ear, nose and throat; (*c*) obstetrics and gynecology; (*d*) public health, including sanitary bacteriology and the communicable diseases.

Parts I and II are written examinations held in any Class A medical school and Part III is entirely practical and clinical and given by subsidiary boards in Boston, New York, Philadelphia, Minneapolis, Iowa City, San Francisco, Denver, New Orleans, Baltimore, Galveston, Cleveland, St. Louis, Chicago, Washington, D. C., and Nashville. The fee is $25 each for the first and second parts and $50 for the third.

Three examinations in Parts I and II have been held as follows:

PART I

Date of Examination	Total Examined	Passed	Incomplete	Failed	Percentage Failed
February, 1922	87	80	..	7	8.0
June, 1922	141	88	31	22	15.6
September, 1922	160	95	27	38	23.8
Totals	388	263	58	67	17.3

PART II

Date of Examination	Total Examined	Passed	Incomplete	Failed	Percentage Failed
February, 1922	21	18	..	3	14.3
June, 1922	61	51	..	10	16.4
September, 1922	27	21	..	6	22.2
Totals	109	90	..	19	17.4

The examinations in Part III, which were entirely clinical and practical, were held in several of fifteen subsidiary centers in different parts of the country. The results of the examinations were as follows:

PART III

Examinations of	Total Examined	Passed	Failed	Percentage Failed
1922	28	28	0	0.0

Of the 388 who took the examination in Part I, 58 are listed as incomplete. These are the candidates who took examinations in all but one of the subjects included in Part I. These are listed as incomplete until they have taken an examination also in the remaining subject. They, therefore, are not counted among either those who passed or those who failed.

Forty-one medical schools were represented in Parts I, II and III of the examinations in 1922 and the results were as follows:

College	Total Examined	Passed	Failed	Percentage Failed
Boston University School of Medicine	4	4	0	0.0
Columbia Univ. Coll. of P. and S.	3	3	0	0.0
Cornell University Medical College	7	7	0	0.0
Creighton University Coll. of Med.	4	1	3	75.0
Harvard University Medical School	44	40	4	9.1
Howard University School of Medicine	3	0	3	100.0
Indiana University School of Medicine	1	1	0	0.0
Jefferson Medical College	1	1	0	0.0
Johns Hopkins University Med. Dept.	60	46	14	23.3
Long Island College Hospital	1	0	1	100.0
Loyola University School of Medicine	1	1	0	0.0
Medical College of South Carolina	1	0	1	100.0
Medical College of Virginia	3	2	1	33.3
Rush Medical College	19	16	3	15.8
St. Louis University School of Med.	1	1	0	0.0
Stanford University School of Medicine	2	2	0	0.0
State University of Iowa Coll. of Med.	7	5	2	28.6
Syracuse University College of Medicine	6	5	1	16.7
Tufts College Medical School	7	5	2	28.6
University and Bellevue Hosp. M. Coll.	3	2	1	33.3
Univ. of Buffalo Medical Department	6	2	4	66.7
Univ. of California Medical School	1	1	0	0.0
Univ. of Colorado School of Medicine	5	2	3	60.0
Univ. of Illinois College of Medicine	4	3	1	25.0
Univ. of Kansas School of Medicine	2	0	2	100.0
Univ. of Louisville Medical Department	2	2	0	0.0
Univ. of Michigan Medical School	3	3	0	0.0
Univ. of Minnesota Medical School	4	4	0	0.0
Univ. of Nebraska College of Medicine	10	5	5	50.0
Univ. of Oklahoma School of Medicine	1	0	1	100.0
Univ. of Oregon Medical School	15	11	4	26.7
Univ. of Pennsylvania School of Med.	47	38	9	19.1
Univ. of Pittsburgh School of Medicine	7	5	2	28.6
Univ. of Tennessee College of Medicine	4	0	4	100.0
Univ. of Texas School of Medicine	3	1	2	66.7
Univ. of Vermont College of Medicine	1	0	1	100.0
Univ. of Virginia Dept. of Medicine	3	3	0	0.0
University of Zurich	2	1	1	50.0
Washington Univ. School of Medicine	15	13	2	13.3
Woman's Med. Coll. of Pennsylvania	36	27	9	25.0
Yale University School of Medicine	5	5	0	0.0
Totals	354	268	86	24.3

Holders of certificates from the National Board of Medical Examiners are registered without further examination in the following twenty-three states:

Alabama	Idaho	Nebraska	Rhode Island
Arizona	Iowa	New Hampshire	South Carolina
Colorado	Kentucky	New Jersey	Texas
Delaware	Maryland	North Carolina	Vermont
Florida	Massachusetts	North Dakota	Virginia
Georgia	Minnesota	Pennsylvania	

A holder of the National Board certificate is eligible for the regular medical corps of the United States Army and the United States Navy without further professional examination if a review of his examination papers by the boards of examiners of those services is satisfactory. In 1920, a recommendation was adopted by the Triple Qualification Board of Scotland providing that holders of the National Board certificate be admitted to its final examination, and in January, 1921, similar action was taken by the Conjoint Examining Board of England.

Hospital Intern Year

Eleven medical colleges have adopted the requirement of a fifth year to be spent by the student as an intern in an approved hospital or in other acceptable clinical work before the M.D. degree will be granted. These colleges and the years when the requirement became effective for matriculants and graduates are as follows:

	Affects Matriculants	Affects Graduates
University of Minnesota Medical School	1910-11	1915
Stanford University School of Medicine	1914-15	1919
Rush Medical College (University of Chicago)	1914-15	1919
University of California Medical School	1914-15	1919
Marquette University School of Medicine	1915-16	1920
Northwestern University Medical School	1915-16	1920
University of Illinois College of Medicine	1917-18	1922
Loyola University School of Medicine	1917-18	1922
Detroit College of Medicine and Surgery	1919-20	1924
College of Medical Evangelists	1922-23	1927

The hospital intern year has been adopted as an essential qualification for the license to practice in ten states, becoming effective in different years, as follows:

State Board of	Affects Student Matriculants	Affects All Applicants
Pennsylvania	1909-10	1914
New Jersey	1911-12	1916
Alaska	1912-13	1917
Rhode Island	1913-14	1917
North Dakota	1913-14	1918
Washington	1914-15	1919
Illinois	1917-18	1922
Michigan	1917-18	1922
Iowa	1918-19	1923
Texas	1919-20	1924

Recognition of Government Examination

The examination given under federal authority, which should be generally recognized by all state licensing boards as a qualification for license to practice medicine, is that given to medical officers of the United States Army, Navy, and Public Health Service. In fact, retired officers from the services mentioned are now eligible to receive licenses without further examination in

Alabama	Illinois	Utah
Arizona	North Carolina	Virginia
California	Pennsylvania*	Wisconsin
Colorado	Porto Rico	

*Army and Navy only.

Proportion of Physicians to Population

State	Population (1920)	Physicians* (1922)	People to Each Physician
Alabama	2,348,174	2,313—	1,015
Arizona	333,903	372—	897
Arkansas	1,752,204	2,303—	760
California	3,426,861	7,549+	454
Colorado	939,629	1,882+	499
Connecticut	1,380,631	1,727—	799
Delaware	223,003	265+	842
District of Columbia	437,571	1,924+	227
Florida	968,470	1,348+	718
Georgia	2,895,832	3,274—	885
Idaho	431,866	452—	956
Illinois	6,485,280	10,716+	605
Indiana	2,930,390	4,353—	673
Iowa	2,404,021	3,490—	689
Kansas	1,769,257	2,497—	709
Kentucky	2,416,630	3,157—	766
Louisiana	1,798,509	2,058+	874
Maine	768,014	1,067—	718
Maryland	1,449,661	2,349—	616
Massachusetts	3,852,356	5,977+	645
Michigan	3,668,412	4,653+	788
Minnesota	2,387,125	2,774+	860
Mississippi	1,790,618	1,792+	999
Missouri	3,404,055	5,827—	584
Montana	548,889	568—	966
Nebraska	1,296,372	1,913—	678
Nevada	77,407	140—	553
New Hampshire	443,083	615—	720
New Jersey	3,155,900	3,362+	939
New Mexico	360,350	399—	903
New York	10,384,829	16,857+	616
North Carolina	2,559,123	2,226—	1,149
North Dakota	645,680	517—	1,248
Ohio	5,759,394	8,086—	712
Oklahoma	2,028,283	2,600—	779
Oregon	783,389	1,158+	677
Pennsylvania	8,720,017	11,241—	775
Rhode Island	604,397	754—	801
South Carolina	1,683,724	1,368—	1,231
South Dakota	636,547	630—	1,010
Tennessee	2,337,885	3,228—	724
Texas	4,663,228	6,094—	765
Utah	449,396	497+	904
Vermont	352,428	556—	634
Virginia	2,309,187	2,503—	918
Washington	1,356,621	1,756—	772
West Virginia	1,463,701	1,751—	836
Wisconsin	2,632,067	2,772+	950
Wyoming	194,402	263—	739
Totals	105,708,771	145,966+	724

* The plus and minus signs indicate, respectively, an increase or a decreased in the number of physicians in the state since 1920.

Special Article

THE STATUS OF INSULIN

In November, 1920, while reading an article by Barron, on the relation of the islands of Langerhans to diabetes, F. G. Banting, then assistant in physiology of Western University, London, Ontario, conceived the idea of preparing an active extract of the islet tissue. Barron had called attention to the fact that degenerative changes occur in the acini of the pancreas following ligation of the ducts, and it occurred to Banting that therefore, after sufficient time had elapsed, the pancreas could be removed and the islet extract elaborated. It had been known that total removal of the pancreas in dogs results in severe and violent diabetes. However, attempts at feeding pancreatic tissue had been without beneficial results, and injections of various extracts of pancreatic tissue, although securing a reduction in sugar, had been followed by symptoms which did not warrant their use in the treatment of diabetes. In fact, a complete review of the available literature warranted Banting in formulating an opinion (1) that the secretion produced by the acinous tissue of the pancreas is in no way connected with carbohydrate utilization; (2) that all injections of whole gland extract have been futile as a therapeutic measure, and (3) that the islands of Langerhans are essential in the control of carbohydrate metabolism. It seemed clear, therefore, that the relation of the pancreas to carbohydrate metabolism was dependent on some process controlled by the islet tissue, and Macleod suggested two possible mechanisms whereby this control might be exerted: (1) The blood might be modified while passing through the islet tissue, and (2) the islets might produce an internal secretion.

THE FIRST EXPERIMENT

In May, 1921, the feasibility of the experiment having been recognized by Prof. J. J. R. Macleod, work was begun under the latter's direction in the Physiological Laboratory of the University of Toronto. Under suitable anesthesia, dogs were depancreatized by appropriate surgical methods. Other dogs had been operated on and the pancreatic ducts ligated. After suitable time, the latter dogs were given a lethal dose of chloroform, the degenerated pancreas swiftly removed and then an extract prepared. This extract was injected intravenously into depancreatized animals. As a result, it was shown that intravenous injections of such a solution invariably exercised a reducing influence on the percentage of sugar in the blood and the amount of sugar excreted in the urine. The extent and duration of the reduction varied directly with the amount of the extract injected, and the presence of the extract enabled the diabetic animal to retain a greater percentage of injected sugar than it would otherwise. At that time it was the opinion of Drs. Banting and Best that boiling of the extract made it impossible for it to have an effect on the reduction of blood sugar, and that preparation of the extract in neutral saline solution with retention under cold storage conditions would permit the extract to remain active for seven days. This, in brief, is an account of the first experiments on the production of insulin. This account does not, however, give any indication of the scientific methods employed, of the thoroughly accurate check on the work through the use of suitable controls, or of the great significance of the final result. Furthermore, it says but little of the many years of research by hundreds of physiologists all over the world who contributed their mite to the knowledge of this subject and who trembled repeatedly on the threshold of the final discovery without carrying their experiments to the logical conclusion. It remained for Banting, as the result of an accidental observation made while casually reading an article outside the field to which he devoted himself, to see the final step.

The experiments first carried out by Banting and Best justified the conclusion that some constituent of the pancreas destroys the active principle of the internal secretion of the gland when extracts are made of the whole gland substance by the usual methods. It therefore became apparent that some method of inhibiting this destruction must be secured in a method for preparing the active extract, and for producing it on a larger and more satisfactory scale. Previous experiments by other investigators gave ground for the belief that the pancreas of the fetus furnishes to the mother an internal secretion which is necessary for the metabolism of sugar. This suggested to the Canadian investigators that fetal pancreas might prove a source of an extract rich in internal secretion, and yet free from the destructive enzymes of pancreatic juice. Experiments were therefore performed utilizing extracts of fetal calf pancreas, and the results of these experiments showed that neutral saline extracts prepared from the pancreas of the bovine fetus at about the fifth month, when injected intravenously and subcutaneously in depancreatized dogs, markedly reduce the percentage of blood sugar and the daily urinary excretion of sugar. With such injections, a depancreatized dog lived for seventy days. It had previously been shown by Allen that completely diabetic dogs did not live more than fourteen days.

PREPARATION OF THE PURIFIED EXTRACT

In view of the results thus far achieved, the assistance of J. B. Collip of the Department of Pathological Chemistry in the University of Toronto was secured, to take up the problem of isolating the active principle, and with his collaboration an extract was prepared from the whole gland, sterile and highly potent, which was suitable for administration subcutaneously to human beings. With the assistance of Drs. W. R. Campbell and A. A. Fletcher of the Department of Medicine in the University of Toronto, its use was undertaken on patients with diabetes in the wards of the Toronto General Hospital between December, 1921, and March, 1922. The effects of the preparations were observed in seven cases of diabetes mellitus, and it was shown that the results observed in animals could be paralleled in man. Following the injection of the extract, there is a rise in the respiratory quotient indicating carbohydrate utilization, and also a return to the normal blood sugar level. Furthermore, the patients reported a complete relief from the subjective symptoms of the disease. The results warranted the conclusion that in these extracts "we have a therapeutic measure of unquestionable value in the treatment of certain phases of the

disease in man." However, it was also found that, without careful control, severe toxic reactions may be encountered, and the authors warn that this will undoubtedly be a factor in the evaluation of the ultimate therapeutic utility of the method. In the meantime, Professor Collip had shown that an active extract could be prepared from the pancreas of the full-grown ox by using alcohol as an extracting medium so as to circumvent the destructive action of trypsin, as was previously shown by E. L. Scott. The fact that the extracts first studied seemed to cause a certain degree of irritation and involved the use of pancreas of special character and available only in small amounts caused Dr. Collip to elaborate a method for preparation of the extract from adult pancreas by fractional precipitation with alcohol. Briefly stated, it was as follows:

The best method for separating the active principle from protein, salts and lipoids was found to be the following: Equal volumes of fresh minced pancreas and 95 per cent. alcohol were allowed to stand for several hours with occasional shaking, and then filtered. To the filtrate was added 2 volumes of 95 per cent. alcohol. After allowing several hours for precipitation of most of the protein, filtration was repeated, and this filtrate was evaporated to small volume in vacuo at a temperature of from 10 to 30 C. An aqueous extract was thus obtained, which was washed twice with ether in a separatory funnel to remove lipoids, and then further distilled in vacuo to a pasty consistency. Addition of 80 per cent. alcohol and centrifugation then resulted in the formation of four layers, namely, a bottom layer of salt crystals, above it a saturated aqueous solution of salt, above this a flocculent layer of protein, and on top a clear layer of alcohol containing the entire active principle in solution. This top layer was pipetted off, and delivered into several volumes of 95 per cent. or (preferably) absolute alcohol. Several hours were then allowed for the active principle to precipitate out. It was then dissolved in distilled water, concentrated by vacuum distillation, filtered through porcelain, tested for sterility, and delivered to the clinic. Such extracts, practically free from proteins, salts and alcohol-soluble substances, could be made isotonic and injected subcutaneously without local reactions.

During the preparation it is necessary to keep the acidity of the fluid correctly adjusted.

DOSAGE AND ASSAY

It now remained to devise a method for securing accurate dosage, and it was determined that the effect of an extract might be measured by its results when injected into rabbits. Large doses of insulin cause hyperexcitability, followed by coma, rapid breathing, sluggish reflexes and dilated pupils. The effects, on the whole, resemble those of strychnin poisoning. Slight stimuli, even shaking of the floor, caused violent convulsions lasting one or two minutes, and death finally resulted from respiratory failure. Coincident with the appearance of these symptoms is a lowering of the blood sugar. After a large number of these experiments, it was found satisfactory to consider as one unit the amount of insulin which, on subcutaneous injection, can lower the percentage of blood sugar to 0.045 within four hours in a rabbit, weighing about 2 kg., from which food has been withheld for from sixteen to twenty-four hours. Recently prepared solutions are concentrated so that a small volume may contain a sufficient number of units. As pointed out by Macleod, the reason why 0.045 was chosen as a percentage to which the sugar should become lowered is that at this level, almost without fail, the animal develops highly characteristic symptoms. As indicated later this method of assay is not wholly satisfactory and efforts to arrive at still more accurate standards are being continued.

In the meantime, the investigators continued to study the effects of the extract on the chemistry of the blood and the urine in the establishing of a number of important points. It was shown that in the presence of insulin the power to metabolize carbohydrates is restored. When insulin is given, the acetone bodies entirely disappear from the urine, and remain absent so long as the administration is maintained. It is shown that insulin, possibly because of its primary influence on carbohydrate metabolism, also effects the metabolism of fat.

It has been known that a number of procedures will produce hyperglycemia and glycosuria, among them puncture of the floor of the fourth ventricle of the medulla, subcutaneous injections of epinephrin, and the various forms of asphyxia, including ether anesthesia. It was then shown that in rabbits previously fed abundantly with carbohydrates so as to insure a high percentage of glycogen in the liver, none of these experimental procedures would cause more than a slight increase in the blood sugar in animals previously injected with insulin. The importance of the remedy in surgical operations under ether anesthesia in diabetes can therefore be estimated.

As pointed out by Macleod, the therapeutic effects of insulin in diabetes mellitus in man were definitely forecast by animal experimentation in each instance. After all of these effects had been determined in the laboratory, the drug was administered in hospital wards. Had administration been permitted unguided by the results of these observations on rabbits, it seems almost certain that sooner or later an overdose would have been given, causing convulsions, and there would have been no indication as to what remedy should be used. But the experiments on rabbits showed clearly that these serious symptoms may be immediately antidoted by injection of glucose. Furthermore, in several patients in whom these symptoms have appeared, injection of glucose has immediately and permanently removed them. Finally, Jan. 6, 1923, Drs. Banting, Campbell and Fletcher published in the *British Medical Journal* the results of the administration of the drug in fifty cases. The most striking results have been seen in children and young adults, and it is stated that all the patients were benefited by the treatment. On the first and second days of treatment, if sufficient insulin is given, the urine becomes sugar free, and on the second or third day, ketone free. The patient becomes conscious of increasing strength before the end of the first week. Hunger is replaced by appetite, thirst is lessened, edema disappears in about ten days, and considerable amount of physical vigor is restored. The weight frequently increases, and this can be brought about by supplying food in excess of the caloric requirements and with it an increased amount of insulin. One patient, aged 16, who had lost 40 pounds (18 kg.) during three years of diabetes, gained 35 pounds (16 kg.) in less than four months.

THE DISTRIBUTION OF INSULIN

As pointed out in THE JOURNAL Jan. 6, 1923, the discoverers of insulin have assigned their rights in the product to a committee of the University of Toronto,

and patents have been applied for in Canada, the United States, Great Britain and other countries. The committee has decided to expand the production of the drug by collaborating with some firm regularly engaged in the manufacture of organ extracts. A firm was secured which undertook, under an agreement with the university, to manufacture the product. By this agreement, the university contracted not to issue licenses to other firms in the United States until the lapse of a period during which the large scale method could be carried out so as to yield the output of a preparation of standard and uniform potency, both when assayed by the rabbit test and when tested therapeutically on diabetic patients. The firm agreed "to distribute a sufficient number of free samples of their preparation to various physicians specializing in the treatment of diabetes in properly controlled clinics." This collaboration has been in effect for several months, and the American manufacturer has submitted his product to the Council on Pharmacy and Chemistry, which will, no doubt, issue a report within the near future. A product is also in course of submission from the Canadian manufacturer who cooperates with the Toronto insulin committee.

SOURCE OF INSULIN

One of the problems that is giving most concern to the investigators has been the provision at a reasonable price of a considerable quantity of the extract. The entire animal kingdom has been investigated, and particular attention has been given by Macleod to the proportion of potent insulin products from the pancreas of certain fishes. These fishes have been particularly investigated, because in them the islet tissues are separated fairly definitely from the remainder of the pancreas. These experiments are continuing, but it is not possible as yet to state definitely whether or not this will constitute an important source of the product.

MODE OF ACTION OF INSULIN

Other investigations have been concerned largely with the mechanism by which insulin produces its satisfactory results. Thus, Forrest, Smith and Winter have shown that insulin and liver extract in vitro cause an alteration of the rotary powers of glucose and fructose without a corresponding alteration of the copper-reducing power. They state that "a possible explanation of the action of insulin is that it causes a shifting of the equilibrium in the direction of increased γ-glucose formation, which is stored or utilized, and that the increased utilization of sugar by the diabetic after the injection of insulin may be put down to the increased formation of this type of glucose." Their experiments seemed to show that a continual supply of insulin is necessary for the working of some enzymatic body which is responsible for lowering the blood sugar, for the blood sugar invariably rose between insulin injections.

Carrying out the experiments on rabbits still further, McCormick, Macleod, Noble and O'Brien have shown that there is an immediate decline in blood sugar during the half hour following an injection of insulin, but a variability both in the time of onset and in the rate of recovery which afterward occurs. The rate of the initial fall is independent of the nutritional condition of the animal. After from thirty to ninety minutes, the blood sugar rises more rapidly in glycogen-rich animals than in those glycogen free. Within wide limits the dose of insulin has no constant influence on the rate of the fall. These observers have been unable to find that insulin has any influence on the rate of glycolysis in sterile, incubated defibrinated or oxalate blood, or in mixtures of blood and expressed muscle juice. They have elaborated the view that sugar must disappear from the blood because it passes into the tissues, that insulin no doubt also passes out of the blood into the tissues, and that when it enters the tissue cells it sets up in them some process that leads to the immediate disappearance of sugar as such, so that a "vacuum" for sugar is created in the cell, and sugar is withdrawn from the blood more rapidly than the supply can be replenished. "It is possible," the authors say, "that the first step in this process is the formation of some compound between sugar and insulin, and that this may occur in part in the blood itself; but it is unlikely that such an intravascular process is any essential step in the disappearance in blood sugar." In view of the fact that the blood sugar rises much more rapidly in glycogen-rich animals than in those which are glycogen-free after the initial fall after the injection of insulin, the authors consider that it is impossible to make a precise physiologic assay of insulin by determining the percentage of blood sugar at varying periods following its injection. The approximate assay may best be arrived at by measuring the blood sugar from ninety minutes to three hours following the injection in animals from which food has been withheld for twenty-four hours. When considerable doses of insulin are given, the typical toxic symptoms may not appear until the percentage of sugar has fallen considerably below the level of 0.045, at which they most frequently occur with weaker doses. It is therefore the final conclusion that the occurrence of these typical convulsions can not be depended on as an exclusive method of physiologic assay.

CLINICAL USE OF INSULIN

From the fifty cases originally studied by Banting and his collaborators, and from a large number of cases studied by the investigators in various American diabetic clinics, a number of facts relating to the clinical administration of insulin have been determined. In view of the great potency of the remedy for harm when improperly used, it is wise to begin at once to emphasize these facts and to impress them repeatedly on physicians in order that permanent harm may not result. The picture of a successful result has already been given. Such a result is secured when a correct dosage is administered to a patient who, at the same time, is receiving a properly selected diet. Early in the work, preparations of insulin contained certain amounts of protein and split protein products. The natural result was a toxic reaction in a certain number of cases. The present products are practically protein free, so that with the exception of urticarial eruptions in one or two sensitive patients such reactions were not observed among the fifty patients first studied. However, the fall in blood sugar, as has been mentioned, may produce a characteristic train of symptoms when the blood sugar falls to 0.07 per cent. Under the influence of insulin, the patient becomes promptly aware of this. He may first complain of hunger or, most often, of a sense of weakness or fatigue; and, especially if it is his first reaction, he is conscious of some anxiety or of what he calls nervousness, or he

may even show signs of a definite neurosis, with a loss of emotional control, such as crying spells. Almost constantly present is a feeling of tremulousness; but actual tremor is rarely seen. The patient may also have some incoordination of finer movements. Vasomotor phenomena, such as pallor or flushing, a sense of heat, of chilliness or a profuse sweat are common. Should the hypoglycemia increase and the lowering of the blood sugar come to 0.05 per cent., there is an acute distress or mental disturbance, such as confusion and disorientation. Finally, a blood sugar of 0.032 in one patient resulted in a state of coma with hypotonia and loss of the deep reflexes. Several of the patients suffered difficulties of articulation when the blood sugar reached the lower levels mentioned.

Fortunately, these serious symptoms may be relieved by the immediate administration of food. From 50 to 100 c.c. of orange juice has an almost immediate effect in clearing up the symptoms. A better result is obtained with from 5 to 25 gm. of glucose given with orange or lemon juice. "When a patient is unconscious," says Banting, "1 c.c. of epinephrin (1:1,000 solution) should be given intramuscularly followed by glucose by mouth, and if the patient is not well enough in a few minutes to swallow glucose, it may be given subcutaneously or intravenously." Special nursing precautions should be adopted for detection of reactions when insulin treatment is first started, when a new preparation is given and when insulin is administered late in the day, as the reaction may occur during sleep. The patients soon recognize the state of a reaction, and may be able to avert the symptoms of their own accord.

In view of the fact that the insulin effect on the blood sugar is not exerted immediately after subcutaneous injection, it is customary to space the injections so that their effect occurs during the period of assimilation of carbohydrates. This means that the insulin is injected at, or shortly before, the meal. But instances occur, possibly due to delayed or too rapid absorption of sugar into the blood stream, or the use of diets containing too much carbohydrate in which glycosuria may occur or which a reaction may follow. To Banting, this emphasizes the necessity for observing diabetic patients for a short time in the hospital under insulin before returning them to their homes for general treatment.

In establishing the insulin treatment, it is advisable to begin with a moderate dose, gradually increasing it until the desired effect is obtained. The amount of insulin used will depend not only on the carbohydrate tolerance of the patient but also on the height and fixity of the blood sugar level. At present the authors believe that the best results are secured by aiming at maintaining a normal blood sugar level. This is accomplished by injecting insulin in relation to a meal at which a certain amount of carbohydrates is given. As the patients improve, the amount of carbohydrate is increased, and at the same time the amount of insulin is increased.

The most important uses of the product are unquestionably in juvenile diabetics, in whom the mortality previous to the introduction of insulin was almost 100 per cent., diabetics who are undergoing surgical operations, and diabetics with coincident infections, such as tuberculosis, gangrene or syphilis. Many diabetics at the present time are able to exist comfortably and satisfactorily with a well selected diet. On the other hand, many diabetics are not thus amenable to treatment. In the latter group of patients, under the proper administration of insulin glycosuria was abolished and ketones disappeared from the urine and the blood, the blood sugar was markedly reduced and maintained at normal levels, the alkali reserve and alveolar carbon dioxid of patients in acidosis and coma returned to normal, the respiratory quotient showed evidence of increased utilization of carbohydrates, and the cardinal symptoms were relieved with marked clinical improvement. In diabetic coma, insulin may be characterized as a specific.

CONCLUSION

It appears, then, that as a result of a vast amount of research on diabetes mellitus, and still earlier on the physiology and pathology of the pancreas, researches by numerous investigators all over the world, conducted largely on experimental animals, as well as with human beings, there has finally been evolved from the pancreas a principle which has a specific effect on the carbohydrate metabolism of the body. The effects of this extract have been thoroughly studied, and its limitations rather clearly defined. A method of assay is being perfected so that it appears likely that the product will shortly be made generally available to the medical profession. Improperly used, results may occur of such seriousness as to interfere greatly with establishing the true worth of the product. To secure proper results, a knowledge of scientific dietetics is necessary, and carefully controlled laboratory observations are important. Physicians who plan to use the remedy must inform themselves fully of its potency, the symptoms of danger, the proper methods of administration, the proper methods of antidoting unfavorable effects, and the correct manner of evaluating results. If these precautions are observed, there seems to be no reason why any well trained physician should not be able to use the remedy satisfactorily.

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SATURDAY, APRIL 28, 1923

STATISTICS OF THE STATE BOARD EXAMINATIONS

This week, for the twentieth consecutive year, THE JOURNAL publishes statistics based on official reports of examinations conducted by state medical boards, and of registrations by reciprocity and other methods. During these twenty years the work has received increasing support and cooperation from the secretaries of state licensing boards, who have furnished reports of their examinations. The reports have been checked with alumnus lists furnished by the deans of medical colleges, and by this cross-checking, errors have been corrected and the state boards have been notified. Thus, the statistics are made accurate and reliable and state board records have been corrected. We express our acknowledgments for the cooperation of the officers of state licensing boards and medical colleges, which made possible the publication of these statistics.

These statistics are of great importance as they relate to medical education and to medical licensure. For each state they show the number and qualifications of physicians admitted to examinations; the character of the colleges from which they graduated; the numbers registered and rejected, and the percentages. The material is so arranged that the facts regarding any one college or state can be compared with other colleges or states. The statistics show that in some states people are well protected against illiterate and incompetent physicians, while in others, in varying degrees, the opposite situation prevails.

CONNECTICUT AND ARKANSAS

Two glaring instances in which the people are not protected are found in Connecticut and Arkansas. In these states, although reasonably high standards are enforced by the regular medical boards, an open door for those with inferior qualifications is provided by separate boards of eclectic medical examiners. In Connecticut last year the eclectic board licensed seventy-nine physicians, thirty-nine of whom graduated from low-grade medical colleges, and for eighteen no data are found in the official files of medical colleges to show that they graduated anywhere. The eclectic board not only examined the graduates of eclectic schools, but evidently admitted all others who applied, the Connecticut law to the contrary notwithstanding. Of the seventy-nine licensed, thirty-one were graduates who supposedly should have applied to the regular medical board. This group included eleven who graduated from the St. Louis College of Physicians and Surgeons, four from the Kansas City University of Physicians and Surgeons, and one from the College of Physicians and Surgeons of Boston, all of which are nominally regular medical schools and are reported as not recognized by the Connecticut (Regular) Medical Board and by the licensing boards of forty-five other states.

In Arkansas, out of eighteen candidates licensed by the eclectic board, seventeen were graduates of low-grade medical schools. Fourteen of these were from the Kansas City College of Medicine and Surgery, a nominally eclectic institution, reported not recognized by the licensing boards of forty-two states. It is high time Connecticut and Arkansas abolished these eclectic boards, which are making them a literal dumping ground for graduates of inferior medical schools.

THE LICENSING OF OSTEOPATHS

During the last six years, a few boards have admitted osteopaths to their examinations, and have licensed many of them as "physicians and surgeons." The objection to this is not that these candidates are osteopaths but that they are not required to present educational qualifications equal to those demanded of physicians. Inspection shows that osteopathic colleges lack properly equipped laboratories; they lack expert, well trained instructors in the fundamental medical sciences; they seriously lack clinical facilities, and in the instruction the osteopathic idea is so emphasized that the many other valuable therapeutic measures are neglected. Despite these serious deficiencies in instruction, seventy-four osteopaths were licensed last year as physicians—forty-eight in California, thirteen in Massachusetts, eight in Colorado, and five in Texas.

QUALIFICATIONS OF PHYSICIANS LICENSED

Special attention is called to Table J,[1] which shows the classification of the medical colleges from which the physicians licensed in each state were graduated during the last six years. A review of this table shows that California licensed 405 graduates of low-grade medical colleges, the largest number licensed in any state during the six years. The next largest numbers licensed were 177 in Illinois, 150 in Arkansas, 149 in Connecticut, 146 in Massachusetts, 141 in Missouri, and 120 in Colorado. In Missouri, the number of such graduates licensed during the last four years greatly diminished, and, fortunately, the word "reputable" has recently been restored to the medical practice act[2] so that these small numbers may be still further reduced.

1. Page 1233.
2. Medical Licensure in Missouri, Current Comment, J. A. M. A. 80: 923 (March 31) 1923.

An encouraging fact shown in this table is that of the 29,338 physicians licensed whose qualifications were obtained in classified colleges, 23,234, or 79.2 per cent., were from Class A medical schools, while only 4,202, or 16.7 per cent., were from Class B schools, and 1,902, or 4.1 per cent., were from Class C schools. What is still more encouraging is that the percentage of those rated in Class A colleges is increasing each year, while the percentages of those from Class B and Class C colleges are decreasing.

EFFECTS OF PUBLICITY

The effectiveness of publicity in medical licensure may be noted in Table N. Higher standards of preliminary education have been adopted; all states but Colorado require that applicants must have graduated from a medical school; all states now require an examination of all applicants; forty-seven states have obtained and are using the authority to refuse recognition of low-grade medical colleges; forty-four states have established reciprocal relations with other states; ten states require a hospital internship as an essential for the license, and all but two states—Arkansas and Connecticut—have abolished their separate boards of eclectic medical examiners or have limited their authority—and the facts just presented show how important it is that these two states take similar action.

On medical education the effect of these statistics has been even more pronounced. The publicity regarding the failures of graduates at state licensing examinations and with respect to the nonrecognition of various colleges (Table D) has impelled medical schools to improve greatly their facilities for teaching. Such improvements are evidenced by the larger number of colleges which are now recognized in all states as compared to five years ago. Also, as shown in Table A, of the seventy-nine colleges in the United States and Canada that had graduates examined, fifty-nine, or 74.7 per cent., had less than 10 per cent. of failures.

Briefly, to each medical school these statistics show what improvements are essential if its graduates are to succeed in state board examinations; what state boards are requiring as a minimum of preliminary education, and in what states the boards are refusing to examine its graduates. To each state board these statistics show the qualifications of the physicians licensed as compared with those licensed in other states, and the further improvements which are needed in its educational standards and methods of examination. Owing to political conditions and other factors, standards in certain states fluctuate considerably; but, on the whole, there has been decided progress. Continuous publicity has led to a general improvement and a greater uniformity in the methods of examination; there has been a lessened confusion in the licensing of physicians throughout the country, and correspondingly better safeguards for the public against the licensing of those who are incompetent.

HIGH FAT DIETS IN DIABETES MELLITUS

In considering the progress made by the medical profession in the treatment of diabetes mellitus up to the present time, two factors appear of major significance: (1) the discovery that the disease is definitely related to the pancreas and the islands of Langerhans within the pancreas, and (2) the fact that the disease may be controlled through proper adjustment of the diet. Of these two factors, until the recent discovery by Banting, the dietetic control has been the more important. Even with the use of "insulin," however, diet adjustment is a matter of major consideration. As pointed out by Newburgh and Marsh,[1] it was customary at first to use a liberal protein fat diet in the treatment of diabetes mellitus. In 1914, Allen introduced the principle of undernutrition with the object of relieving the strain on the pancreas and of stopping the progress of the disease. Following the leadership of Joslin, who based his regimen on the experimental work of Allen, Woodyatt and others, it has been customary to begin the treatment with a period of fasting, following which the diet is built up, protein, fat and carbohydrate being added within the limits of the patient's tolerance. It has been usual to limit greatly the amount of fat, and it is Newburgh's contention that such limitation frequently results in undernutrition. During the last two years, Drs. Newburgh and Marsh have used diets containing larger amounts of fat than are customary in the practice of most clinicians, and they now publish a final statement which seems to go far toward establishing the soundness of the principles they advocate.

In the system of control which Newburgh and Marsh have adopted in 190 patients, whose records are now analyzed, the preliminary fasts or gradation of diets are discarded and the patients are served with the high fat diet from the day of their entrance into the hospital. After the patient is desugarized, his diet is increased by steps until he is receiving 0.67 gm. of protein and from 30 to 40 calories per kilogram of body weight. In no case is the daily carbohydrate allowance greater than 35 gm., and it is argued that the high fat diet throws into the metabolism much less glucose in proportion to its caloric content than do other types of diet. Furthermore, the records of the cases reported by Newburgh and Marsh indicate that a low protein, low carbohydrate, high fat regimen has produced and maintained in their patients an aglycosuric state; that its use has not been attended by acidosis and, in fact, caused its disappearance when present (short of coma) at the beginning of treatment; that it maintained nitrogen balance; that it did not cause a hyperlipoidemia; that it supplied sufficient energy and, finally, that it permitted activity compatible with earning a livelihood without being attended by downward progress in uncomplicated cases.

1. Newburgh, L. H., and Marsh, P. L.: Use of a High Fat Diet in the Treatment of Diabetes Mellitus: First Paper, Arch. Int. Med. **26**: 647 (Nov.) 1920; Second Paper, Blood Sugar, Ibid. **27**: 699 (May) 1921; Third Paper, Further Observations on the Use of a High Fat Diet in the Treatment of Diabetes Mellitus, ibid. **31**: 455 (April) 1923.

As the authors of this new contribution to the study of the metabolism in diabetes are themselves careful to indicate, statistics as applied to the control of diabetes deal with so many variables that are difficult to control that one must be extremely guarded in drawing conclusions from the results in any series of cases. These variables concern such factors as indiscretions in diet, of which diabetics may be guilty when not under direct control; complications, such as coincident infections, surgical operations and coma; efficiency of the treatment before the patient undertakes a new regimen; duration of the disease; social status and mental habits of the patient, and, finally, variability in individual physicians. With these variables in mind, critical observers hesitate to make any positive assertions as to the importance or the value of the principles which the authors recommend on the basis of their study. However, since Newburgh and Marsh have taken these factors particularly into account in drawing their conclusions, their results merit careful consideration. Even with the introduction into general use of the new pancreatic extract elaborated by the Toronto investigators, the problem of metabolism in this disease will perhaps require as extended and careful attention as has been given heretofore.[2]

EDUCATION OF THE NEGRO PHYSICIAN

In planning for the protection and promotion of the health of the negro population of the United States, the entire country has a deep concern. Statistics show the excessive morbidity and mortality that handicaps the negro race in this country; they prove, further, that no inconsiderable part of the excess is due to diseases communicable without respect to race, and justify the inference that no small part is due to lack of knowledge and to inadequate medical and surgical care. In outlining plans for negro health betterment, no factor is of greater importance than the part the negro himself will play, and particularly the part that will be played by the negro physician.

When the negro physician enters the home of his colored patient or meets him in the dispensary or the hospital ward, he greets him as one of his own people, adapts himself to the needs of the situation, and carries to his patient, and to the home, lessons of sanitation and health that he can enforce to a degree hardly practicable otherwise. That is, he does so if he has been properly trained and has been imbued with a conception of the responsibility of his mission to his race and to the community; not otherwise. To train colored physicians adequately and in sufficient numbers is, therefore, an important part of the service our medical schools owe to the public, and a task demanding the serious consideration of our medical educators.

Among the eighty-one medical schools in the United States, only two in Class A are devoted entirely to the training of colored students. Both of these schools are striving hard to keep pace with the advances of medical education. Both are handicapped by lack of financial support. One, because of lack of such support and because of its unwillingness to accept students in excess of the number that can be properly taught with its limited laboratory facilities and teaching staff, has restricted its classes to fifty students. In consequence, it is turning from its doors applicants fully qualified, according to accepted standards, for the study of medicine. The latest figures available show only 379 students in attendance at these two schools, and the last graduating class of both together numbered but fifty. White physicians will continue for an indefinite time to treat colored patients; but the inadequacy of an annual output of only fifty colored physicians is apparent when it is borne in mind that our colored population exceeds ten million. In the development of educational facilities for the training of colored physicians there is, therefore, a field that may well be cultivated by those prepared to give financial aid to medical education.

Current Comment

NEW YORK GOVERNOR ADOPTS RATIONAL PLAN FOR HEALTH CONTROL

Governor Smith of New York recently set a commendable example in his approach to the health problems of his administration. Recognizing that disease is not a respecter of persons and that the prevention of disease and the promotion of health are not party issues, he sought counsel where it could best be obtained, and called into conference representatives of the state medical society. Personally, and through the state health commissioner and others, he submitted to the conference four of his most important health problems—control of narcotic drugs and addicts, medical service for sparsely settled rural districts, enforcement of the medical practice act, and promotion of medical research. Open discussion was followed by the appointment of a committee to draw up a statement of the conclusions agreed on, and to formulate plans to carry them into effect. After consideration of the findings and plans submitted, the governor sent to the legislature a message covering the two most urgent matters, narcotic drug control and medical service for sparsely settled districts, with recommendations for appropriate legislation. Certainly, added weight is given to the measures proposed by the governor, because of the method by which they were formulated, and the burden of the legislature is lightened by the reduction and simplification of the controversial questions, resulting from the same cause. These circumstances should go far toward bringing favorable action on the governor's recommendations. But whether they are or are not favorably acted on by the legislature, the governor is to be commended for the course he has pursued. The state medical society is entitled to credit for the part it played in the development of the situation and for its generous acceptance of the responsibility placed on it

2 The Status of Insulin, Special Article, this issue, p. 1238.

by the governor. The transfer of the scene of activities from the executive to the legislative chamber, however, imposes on the society new responsibilities, and on the wisdom with which it steers its course will depend very largely whether future governors of New York and the governors of other states adopt the policy so ably laid down by Governor Smith.

WHAT LOS ANGELES THINKS OF THE ABRAMS CULT

In the *Bulletin* of the Los Angeles County Medical Association, published April 5, 1923, there appeared this item:

The following resolution was adopted at the meeting of the Board of Councilors held March 12, 1923: "It shall be the sense of the Council that Abrams' method of diagnosis is a fraud. Any physician practicing this method is ineligible to membership. If a member, he shall immediately cease this method of practice or charges of unethical conduct shall be preferred against him."

If more medical societies would take this action, the activities of those now exploiting the Abrams nonsense [1]—diagnosing syphilis in healthy persons and professing to cure cancer by means of the "Oscilloclast"—would be confined to those "drugless healers" and "advertising specialists" who already form so large a part of Abrams' disciples.

THE NATIONAL BOARD OF MEDICAL EXAMINERS

With the state board statistics published this week appear also statistics [2] showing the results of examinations held by the National Board of Medical Examiners. During the first six years of its existence, the National Board held eleven examinations. Each was held in a large city, and those wishing to take the examination, unless they happened to live in that particular city, were required to travel long distances in order to take the examination. As a consequence, only 325 candidates were examined and 268 certificates issued—an average of forty-five each year. At the beginning of the board's activities, in an editorial comment,[3] THE JOURNAL urged the adoption of an arrangement whereby the examinations could be held simultaneously in different cities, so that candidates would not need to spend so much time and money to take them. During 1921, therefore, the plan was adopted whereby the examination was divided into three parts, or three examinations, one at the end of the second year, one at the end of the fourth year and one after the graduate has completed his internship. An arrangement was made also whereby the first two examinations could be taken in any Class A medical school, and the third examination, which is entirely clinical and practical in its nature, could be taken in any one of fifteen large cities distributed in various parts of the country. The new plan has been a great success, as shown by the fact that in the first year 412 candidates were examined, eighty-seven more than were examined in all six previous years. It is interesting to note that the examinations held by the National Board are now widely recognized by state licensing boards. As noted in the statistics, holders of the certificate are now eligible for registration without further examination in twenty-three states, and it is only a matter of time when the certificate will be recognized by all state boards. It is already being regarded as an evidence of excellent qualifications both in this country and abroad. The certificate, therefore, even now, has a value far greater than the money and time required by the student to take the examination.

1. A reprint of the Abrams vagaries will be sent on receipt of four cents in stamps.
2. See page 1236.
3. National Board of Medical Examiners, Current Comment, J. A. M. A. 66:745 (March 4) 1916.

Association News

THE SAN FRANCISCO SESSION

Alpha Kappa Kappa Banquet

The Alpha Kappa Kappa fraternity has arranged for a banquet to be held on the evening of June 28. All members attending the annual session are strongly urged to communicate with the chairman of the banquet committee at 100 Judah Street, San Francisco. Sigma chapter's new home at this address will be open to all members, and opportunity will be afforded them to register as soon as they arrive. Dr. Louis W. Achenbach is secretary of the chapter.

Bring Your Blue Fellowship Card

Registration will be made much easier for Fellows and for the Registration Bureau at San Francisco if each Fellow will bring his Fellowship card for 1923, and present it when registering. Complete instructions about registration will appear in the San Francisco Number of THE JOURNAL, to be issued during the month of May. All Fellows who have been reported to the American Medical Association for enrolment as members of constituent state medical associations and who have paid their Fellowship dues have had 1923 blue Fellowship pocket cards sent them.

Meeting of the Medical Veterans of the World War

There will be a meeting of the Medical Veterans of the World War at 2:30 p. m., Tuesday, June 26, at the Civic Auditorium in San Francisco. Lieut.-Col. Bertram F. Alden, San Francisco, is the chairman of the local committee of arrangements of this organization, and Dr. Arthur T. McCormack of Louisville, Ky., is president of the Medical Veterans.

Invitation to Members of Section on Ophthalmology and Section on Laryngology, Otology and Rhinology

Members of the Section on Ophthalmology and of the Section on Laryngology, Otology and Rhinology are extended a most cordial invitation to stop off at Omaha, on their way to San Francisco to attend the annual session of the American Medical Association, to play golf. Dr. Clarence Rubendall, Brandeis Theater Building, Omaha, will advise those interested concerning arrangements that have been made for their convenience.

Golf and Country Club Entertainment

An attractive program, including two tournaments, has been arranged for golf enthusiasts. Through the activities of Dr. James Eaves, chairman of the Committee on Golf and Country Clubs, the cooperation of all golf and country clubs throughout California has been obtained. Fellows visiting San Francisco during the session will receive any desired information relative to golf by communicating with the chairman or any member of the golf committee at headquarters or at the Civic Auditorium.

Tournaments are arranged for Fellows of the American Medical Golfing Association, and also a tournament for Fellows not members of this organization at the San Francisco Golf and Country Club and at the Lakeside Golf and

Country Club, respectively, Monday, June 25. Other tournaments will also take place during the week of the session, in and around San Francisco and various parts of the state. All Fellows, and particularly those members of the American Medical Golf Association who desire to take part in the tournament, are requested to communicate with the chairman, Dr. Eaves, 808 Balboa Building, San Francisco, as soon as possible.

ANNUAL CONGRESS ON MEDICAL EDUCATION, MEDICAL LICENSURE, PUBLIC HEALTH AND HOSPITALS

Held in Chicago, March 5, 6 and 7, 1923

(Concluded from page 1154)

PUBLIC HEALTH

MARCH 7—AFTERNOON

Report of Conference on "The Education of Sanitarians and the Future of Public Health in the United States"

DR. HUGH S. CUMMING, Washington, D. C.: There is a dearth of persons properly qualified to fill the various positions in public health activity, ranging from state and city health officers to county medical officers, inspectors and public health nurses. There are many important public health positions now filled by untrained or incompetent persons, and by men trained in the expensive school of experience. The importance of the conservation both of the life and of the healthfulness of the individual is more fully appreciated now by all classes of people in this country than ever before. This general interest is realized by the professional politician and by professional uplifters and agitators, and it is realized also by that not inconsiderable number of selfish, sordid interests that thrive on ignorance and necessity, especially in the rural regions of our country. The medical profession has been backward in realizing the significance of this movement, and when it has proved evident in part to them they have too often developed a defense reaction, manifested in various degrees from open antagonism to indifference toward public health movements.

Early in 1922, I issued a call for a conference on "The Education of Sanitarians and the Future of Public Health in the United States." This conference was held in Washington, March 14 and 15. For the first time, presidents of universities and deans of medical schools came together with leaders in the field of public health to discuss this important subject of common interest.

The addresses of the conference and subsequent studies have revealed in a striking manner the present dearth of health officers, and the lack of training on the part of many now holding positions in public health work. Although there are approximately 10,000 public health workers of various kinds now engaged on a full-time basis by official health organizations, there will be required, according to John A. Ferrell, a force of approximately 30,000 within the next twenty years, in addition to those needed by private health agencies. Furthermore, while there are now 11,000 public health nurses in all types of health work, there is need, according to the recent report of the Committee for the Study of Nursing Education, for approximately 50,000 to serve the present population of the United States. Public health work has become differentiated into many more kinds of occupations than physicians or even sanitarians generally realize. There are various types of administrative work in rural, municipal, state and federal agencies, and in dispensaries, industrial health service and school health work; there are sanitary engineering; public health laboratory work (including bacteriology, entomology and chemistry); vital statistics; dispensary medical practice; dispensary dentistry; psychiatry and psychology, physical training, public health nursing and hospital social work; nutrition work; inspection work; popular health education; public health law, and research. One or more of these occupations are now to be found in the fields of general public health, tuberculosis work, social hygiene, mental hygiene, cardiac disease work and child hygiene.

Partially as a result of this attitude, there were graduated from nine universities with various kinds of public health degrees only 106 persons in 1921, of whom only twenty-one were doctors of public health, although the number of graduates from medical schools the same year was approximately 3,200.

Report of Activities Carried On by the Public Health Service Subsequent to the March, 1922, Conference on the Education of Sanitarians

DR. W. F. DRAPER, Washington, D. C.: From the various medical schools and universities, considerable information has been obtained regarding facilities offered for the education of sanitarians. It appears that there are at least eleven well established schools and departments of hygiene and public health in the universities of the United States, and other universities offer a large number of public health courses. While the University of Chicago has no separately organized school of public health, it offers approximately thirty-five courses in public health subjects. A new interest has been manifested during the last twelve months in the development of public health courses.

Considerable data have been collected from city and state departments of health and from other sources regarding the problem of salaries and tenure. The tenure situation needs to be corrected. Too frequently, well qualified health officers are displaced wholly for political reasons. On the other hand, it is believed that the salary problem is a more fundamental one. When higher salaries are paid and full-time health officers with proper training are employed, they should be able so to win the support of the people that heads of municipalities and states will have neither the desire nor the temerity to request their resignations. Special efforts must be made to establish higher standards of training in the employment of city and state health officers, and to bring about the payment of higher salaries so that well trained persons may be attracted to these positions. In an effort to win the support of mayors, governors, members of city councils and state legislatures and similar persons to the establishment of such standards, the service is planning to distribute among these officials a booklet setting forth the importance of well organized public health work. A preliminary draft of this publication has already been prepared.

As a result of communications with a few universities and colleges in the eastern part of the country, the service has found that there is a demand for lectures on the subject of public health work as a life career, and, consequently, a schedule of addresses is now being arranged for approximately fifteen universities and colleges in New England, New York and New Jersey. Preliminary steps have been taken to establish a clearing house for schools of public health and health departments.

On the recommendation of a subcommittee which met last July at Columbia University, and on the endorsement of the Advisory Committee, the Public Health Service is about to print and distribute among universities and colleges a report recommending the incorporation in the college curriculum of public health courses for all students. It is recommended that a one or two semester course in personal and community hygiene of approximately three hours be required of all first year students. The report recognizes that the selection of courses by those students planning to enter public health work as physicians or sanitary engineers will be determined by the requirements of schools of medicine, public health and engineering, but it also takes cognizance of the fact that an increasing number of students are entering public health work without a medical or engineering degree.

The Recruiting of Sanitarians for the Future Service of the State

DR. C. E. A. WINSLOW, New Haven, Conn.: The recruitment of leaders of sound training and high natural capacity is the crux of the public health movement of the present day, and the discussion of this problem, which has been stimulated during the past year by General Cumming and his associates of the Public Health Service, is fraught with

the deepest importance for the future of the movement which we have at heart.

The demand for qualified sanitarians is increasing year by year, and for the moment at least this demand is far in excess of the supply. We hear much about meager remuneration and insecurity of tenure. Yet from my experience of nearly twenty-five years in the training of public health workers I can quote the conclusion of the psalmist that in this field "I have not seen the righteous forsaken nor his seed begging bread." When a health officer with proper qualifications loses his position, it is nine times out of ten as a result of temperamental characteristics which disqualify him for the successful execution of his task; and for every man who is hampered by political pressure there are a dozen other openings crying out for his expert direction.

The recruitment of the best type of young medical graduates as the leaders of the public health movement of the future is a primary essential for the success of our cause.

The first essential factor in this problem is the question of the place and the content of a course in public health in the undergraduate medical curriculum. It was clear to us from the beginning that the second year was no place for such a course unless the subject was to be regarded as an accidental and unimportant offshoot from bacteriology. For some time we placed the course in the third year; but we found that here it came into serious conflict with the clinical work of the students, just admitted to the wards of the hospital, naturally and properly preoccupied with the fascinating problems of disease in the individual human body. We have now transferred our course to the first half of the fourth year, where it is allowed ninety hours of lectures, discussion and field work. By the fourth year the student has sufficient medical knowledge to realize what the modern public health campaign really may mean; and our effort is to include in the course a summary and a synopsis of the broader community applications of all that he has learned during his preceding three years, and to bring them into proper relation to the movement as a whole.

The Steps Already Taken in the Standardization of Public Health Training

DR. A. J. MCLAUGHLIN, New York: Annually, for several years, the Council on Medical Education and Hospitals of the American Medical Association has presented partial data on the institutions giving courses leading to public health degrees. The first real effort at standardization of these degrees was made at a conference held at Yale University early in 1919.

The next step was the appointment of a committee of sixteen in November, 1919, by the American Public Health Association on the Standardization of Public Health Training.

Of the many degrees which have been offered, the Certificate of Public Health (C.P.H.) has been given to the largest number of students. The next largest number of students have received the Bachelor of Science degree in Hygiene or Public Health. The C.P.H. and the Master's degree are given by several schools on the completion of one or two years of special study following either graduation in medicine or graduation from a college or a university. The course is never completed in less than one year for either medical or college graduates, and the latter usually require at least two years unless their undergraduate preparation in bacteriology, anatomy, histology, embryology, physics and chemistry has been unusually complete. The Bachelor's degree in Public Health is given by several schools which have the facilities for placing a broad fundamental public health training in the curriculum of regular four year courses. It would be undesirable completely to regulate or standardize the courses of study for these or any other degrees in a relatively young and rapidly growing profession like public health. It is desirable and important that the student may secure a proper perspective for public health work, and in the interest of unity and perspective it is in many ways desirable that certain fundamental lecture courses should be continued throughout the year. Laboratory courses may profitably be given intensively, but to turn over the students to one specialist after another in rapid succession would result in giving them solid blocks of highly specialized information which they could adapt to their own professional work only with great difficulty.

The number of graduates obtaining the Doctor of Public Health degree is increasing. In the majority of schools, but not in all, graduation in medicine is a prerequisite. In no case is the Dr.P.H. degree offered to a candidate who has not either the medical degree or the Bachelor's degree, and in no case is it possible to secure the Dr.P.H. degree with less than seven years of study following high school graduation. The Doctor of Science and Doctor of Philosophy degrees in Public Health are given on the same basis as in other fields.

DISCUSSION

DR. RAY LYMAN WILBUR, Stanford University, Calif.: In the curriculum committee of the Association of American Medical Colleges we have been making a steady endeavor to increase the number of hours that can be used for public health training and for training in hygiene. The courses in medical schools on public health and hygiene have, speaking in a broad way, been given by some one whom they wanted to give an easy and agreeable job. As I become associated more and more with educational institutions, I have become "course shy." Courses, courses—it seems to me, I live in an atmosphere of courses, and I am thoroughly tired and sick! When a man tells me he has given the same courses for twenty years, I say, "For goodness sake, why does not the Lord get busy!" When I talk of introducing more time into the curriculum for hygiene and public health, I fear it may take the form of some lecture courses that will be given in a stereotyped form year after year without any vitalizing effect. These courses can be given in a live way. We are training students so that they learn by doing, not by hearing, and public health instruction in a medical school must be organized on that basis. Students must go out and do the work. In the standardization of public health courses do not forget that we are trying to get over the standardization of medical courses. Give the individual institution and the individual man a chance to develop in their own way as much as you can, and also keep character and personality in the subject because, if you do, it will develop leadership just as it should in medical education.

DR. JOHN SUNDWALL, Ann Arbor, Mich.: At the University of Michigan we are attempting to stimulate interest in and to recruit workers for the public health field. In addition to the required courses in hygiene and public health in the schools of medicine, dentistry and pharmacy, all entering freshmen are required to take six lectures on the fundamentals of health promotion and disease prevention. At the conclusion of these lectures, the students are made acquainted with and urged to elect later a course included in the regular college curriculum. About 200 college students elect this course each year. Besides the aims, interests and activities of public health agencies, official and voluntary, the students' attention is called to the opportunities for those trained for public health work. In this way, all students are made acquainted with the machinery of public health, through the medium of the six required lectures. More than 500 students, annually, by means of the elective courses in the college or the required courses in medicine, dentistry and pharmacy, are made familiar with the opportunities that public health in the future will have to offer as careers. We are only in the second year of this attempt to stimulate interest in public health as a profession, and there is already abundant evidence that our efforts are bearing fruit. Public health directors should be trained in those larger universities where there are schools of medicine, engineering and education, in association with the college and the graduate school. At the University of Michigan, two programs of study are offered in the graduate school: one of one year's duration leading to the degree of Master of Science in Public Health; the other of two years' extent leading to the degree of Doctor of Public Health. The demand for trained workers in various fields of public health is even now much greater than the supply. We know of no profession which offers better opportunities to college women. The demand for trained workers in these fields will be second only to that of the teaching

profession. Programs of study in the college leading toward public health work will contribute largely to this demand on the part of college women. Vital statisticians, laboratorians, sanitary inspectors, school health supervisors, public health educationalists and medicosocial workers are among the special positions in health work that should appeal to college women and for which special training courses are being arranged at the University of Michigan. The first two years of a four year program of study leading to public health work will be based on a liberal education. Psychology, biology, sociology and chemistry should be included in these first two years. The second two years will include subjects of cultural value and, in addition, special courses bearing directly on public health specialties. It will be proposed that the degree of Bachelor of Science in Hygiene be given on the satisfactory completion of these programs of study. The nurse's relationship to public health is proving to be similar to that of the physician. It is not possible, nor is it desirable, that a physician should be at the head of all public health activities, although for certain phases of the work, the physician's services are indispensable. This situation is true also for the nurse, whose services in certain fields are indispensable. As the pioneer of public health, the public health nurse is rendering invaluable service. Her untiring labors in the counties and rural districts deserve the highest commendation. They are serving well in capacities of school and industrial nursing.

DR. EDWIN O. JORDAN, Chicago: Two assumptions underlie largely a discussion of public health education. The first and most fundamental question is, Are we getting the right type of man in the work? I agree with Dr. Winslow that we should not lay too much emphasis on the financial aspects of the matter. The first consideration of the poet, the artist, the man of science is not the financial rewards; oftentimes he is working at a great financial sacrifice. Hundreds of public health workers are carrying on their work at great personal and financial sacrifice. That is the type of man we should watch for; and what General Cumming is doing in trying to interest and select the right type of man is fundamental. The right man may be trusted to work out his own education if given reasonable opportunity. First of all, we must have the man. The second assumption is that the fundamental education is what it should be. We are loading up students not only in medical courses but also in our fundamental instruction in secondary schools and colleges, with the result that spontaneity of the student is often entirely smothered by a plethora of courses, as Dr. Wilbur has pointed out. The public health official ought to be allowed to keep his mind elastic, ready to receive new impressions, to act on new information, and to abandon outworn creeds. Having got the right type of man, we should not smother him entirely in our fundamental requirements.

The Education of the Partially Trained Sanitarian Now Employed

DR. FREDERICK W. SEARS, Syracuse, N. Y.: This article will appear in full in THE JOURNAL.

DISCUSSION

DR. RAY LYMAN WILBUR, Stanford University, Calif.: The great danger of the health officer is to have large authority and too little information. Partially trained sanitarians are in that danger a good deal of the time. The plan suggested by Dr. Sears seems to be the practical and right one—to teach these men something they want to know. At the same time, if you can develop their social sense, they may become satisfactory health officers in their communities.

DR. W. S. RANKIN, Raleigh, N. C.: I have been impressed by what has been said with respect to the personal and educational qualifications of men entering public health. Public health work in this country has reached a place at which it is not so much a matter of money as it is of getting the right sort of people to engage in public health work. In some places they are limiting the requests for appropriation by the available supply of personnel; therefore the question of personnel is of great importance. From my experience of fourteen years in employing health officers and nurses, personal qualifications are most important. I have seen many men promoted in the country on account of their personal qualifications. I do not recall a single person demoted who had the right qualifications.

DR. HAVEN EMERSON, New York: In the main, except in the federal Public Health Service and in the army and navy, accident and opportunity have been the chief factors in the selection of the present personnel of health departments and private health agencies. This situation has resulted from the astonishing rapidity with which public demand and private interest in health service have followed the interpretation of preventive medicine to the public, and because more of the educational institutions of the country did not realize the public needs until after popular interest had resulted in a tremendous expansion in the appropriations, the authority, the personnel and functions of health service. Since 1907, the number of public health nurses has increased from 119 to 12,000, and well organized courses for nurses in the theory and practice of disease control and health development have been in operation for many years. As long as there is so much uncertainty in the permanence of tenure and such inadequacy in the financial returns, it will be largely a waste of time and effort to erect great educational structures primarily for the training of men and women for professional careers in preventive medicine I would put under three professional groupings the hospital administrator, the public health nurse and the industrial hygienist, reasonably well paid in return for the time spent in acquiring an education. Beyond that, we have the other groups: health officers, medical school inspectors, and assistants in the field of public health administration; sanitary inspectors and engineers, vital statistics, preventable disease control, laboratories, foods, and practical instruction in child hygiene and education. These are the fundamental bureaus which are now employing assistants in public health. Before the end of the present year, at the College of Physicians and Surgeons of Columbia University, one half of the fourth year class will begin an elective course of eight weeks in the practice of preventive medicine, with half a day spent in such subjects as public health, medical school inspection, examination of schoolchildren, psychiatric work, psychiatric examination in schools and prenatal supervsion.

DR. OLIVER W. H. MITCHELL, Syracuse, N. Y.: We cannot all do as much as some large universities are doing unless we have the facilities and the money to work with. That situation was what confronted us in central New York. The health council of the state fixed certain requirements for health officers, and we felt we should cooperate in every possible way, to train these men along the lines laid down. We instituted a short course for women and men, some of them already occupying positions as health officers. With this course we did very well as compared with the regular course in public health; nevertheless, there is still need for such instruction, and it is up to many institutions, like Syracuse, or perhaps institutions not having as many facilities as Syracuse, to offer such help to the men in the field. As far as medical students are concerned, we have felt it unwise to teach them hygiene without practical demonstrations, so we keep the teaching of hygiene in the medical school closely tied up with what is going on in the city.

DR. ARTHUR T. MCCORMACK, Louisville, Ky.: We have had some public health expositions that have been of tremendous educational value to both sanitarians and physicians. In Louisville, 110,000 people came to see the public health exposition, which was so conducted that 12,000 different people took part in either the exhibits or the program. Demonstrations were made of modern public health machinery, and each man who was put on a demonstration had the chance to find out what people thought of his method of education. It was extremely interesting also to college professors, university men, and representatives of commercial activities, who offered for sale things that promote people's health and happiness. It has been of great value in these expositions that several hundred physicians took part in the exposition and learned to talk to people regarding the common problems in public health.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

CALIFORNIA

Tropical Disease Clinic for American Medical Association.—The medical staff of the Navy Hospital, Balboa Park, will give a clinic on tropical diseases for the Fellows of the American Medical Association, July 3.

Bill to Protect the Public.—A bill making it unlawful for any person who professes to treat the sick to use the words, letters, or title of doctor, or physician and surgeon, on doors, windows, signs, and other places unless such letters or titles are accompanied by the degree on which his title is based, with the name of the school that conferred it, has passed the senate and assembly.

CONNECTICUT

Yale University School of Nursing.—President Angell announced, April 24, the establishment at Yale University, New Haven, of the first university undergraduate school of nursing in the United States, the funds for which will be provided by the Rockefeller Foundation. The school will have its own dean, its own faculty, buildings and budget, and will not be dependent on medical schools and hospitals. The Yale school will break away from the apprenticeship system of nurse training and will attempt to develop an educational program closely related to and dependent on the practical work; in focusing attention on the educational training of the student, many routine tasks which contribute little to this training will be eliminated and the period of preparation thus shortened. About twenty-eight months will be required for the course. A high school course or its equivalent will be required for admission. The most significant feature of the school will be the character of the training. All factors will be presented which contribute to the diagnosis, care and treatment of disease, and which relate to the conservation of health. Patients will not be considered as hospital "cases" only, but such factors as heredity, environment, child development, psychology, economics, sociology, industry and public health will be presented in their bearing on each problem studied. Properly to develop such conception of disease, the new school will embrace field work and community nursing as part of the basic training.

DELAWARE

Physicians Protest Treatment by Legislators.—Physicians of the Newcastle County Medical Society are reported as indignant at the treatment accorded the legislative committee of the society by the temperance committee of the Delaware House of Representatives. The legislative committee requested a hearing on a pending bill permitting the distribution of alcoholic preparations for medicinal use under certain restrictions, but its request was refused under conditions that seemed to reflect on the dignity of the society and of the committee.

DISTRICT OF COLUMBIA

Lectures on Anthropology.—Dr. Ales Hrdlicka, Washington, is giving a course of lectures on anthropology, with special reference to Czechoslovakia, at the Prague Medical Faculty. Dr. Hrdlicka was born in Bohemia.

GEORGIA

Hospital News.—Plans have been completed for the erection of the Albert Steiner Memorial Hospital at Atlanta at a cost of about $300,000. This institution, which will be operated in conjunction with the Grady Memorial Hospital, will be for the free treatment of cancer. It will be maintained largely from income from the Steiner estate. Radium valued at $75,000 will be provided for the institution.——Plans for the proposed half million dollar State Tuberculosis Sanatorium at Alto have been published. They include administration buildings, two infirmaries, a power plant, and laundry. The legislature will be asked to appropriate $250,000 for the buildings, the counties to pay the remainder.

ILLINOIS

Personal.—Dr. James T. Jenkins, Carthage, was recently elected president of the Hancock County Medical Society.—Dr. John A. Wheeler, former state senator from the Springfield district, has been appointed superintendent of the Lincoln State School and Colony to succeed the late Dr. Samuel A. Graham, of Clinton.

Hospital News.—The new $300,000 Victory Memorial Hospital, Waukegan, will be dedicated, Memorial Day, May 30, and opened to patients a few days later.——The cornerstone of the new building for the Palmer Tuberculosis Sanatorium, Springfield, will be laid in June on the tenth anniversary of the establishment of the institution.

Physicians Fined.—It is reported that Drs. John R. Thomson and John F. Shrader of Bridgeport, and Arthur R. Lindsay of Pinkstaff, pleaded guilty recently to violating the vital statistics law which requires registration of births within ten days, and were fined the minimum fine of $5 and costs. The complaints were filed by a special agent of the department of public health.

Tuberculosis Sanatorium Survey.—The state department of public health has recently completed a survey of the eleven county tuberculosis sanatoriums in operation in Illinois. There is a maximum capacity of 400 beds; the average number of patients cared for was 331; the average cost of maintenance each month for all the sanatoriums is $25,300, or slightly more than $76 a month for each patient. The survey showed that four sanatoriums hold diagnostic clinics; eight conduct dispensary service, and seven conduct, in some measure, county tuberculosis and public health work. The lowest appropriation for any of the sanatoriums for 1923 is $10,000, but a contract with the U. S. government to care for tuberculous ex-service men makes the total amount available in that instance nearly $30,000. Nine sanatoriums have appropriations ranging from $25,000 to $40,800 for maintenance; another has an $18,000 budget.

County Hearing Boards.—Plans for establishing a hearing board for every county in the state have been worked out by the state department of public health. The purpose of the boards is to give physicians, local registrars, midwives and others who are charged with violations of the vital statistics or other laws and regulations, an opportunity to state their cases to show cause why they should not be prosecuted in the courts. It is planned to request court action in only those instances in which circumstances indicate wilful and repeated violations, the aim of the hearing boards being to stimulate friendly cooperation through education. According to plans, the boards will consist of the local state's attorney, the local health officer and the district health superintendent, or a member of the state department of public health from Springfield. Such a board recently heard in Carroll County the case of the Lanark health officer charged with failing to quarantine and report cases of communicable diseases. Another sat in Lee County, where a physician was charged with failure to report smallpox. In both instances, the charges were dismissed on promises to observe the laws in the future.

Chicago

Joint Medical Meeting.—The Chicago Ophthalmological Society held a joint clinical meeting with the Chicago Oto-Laryngological Society, April 16-17. Dr. William L. Benedict of Rochester, Minn., read a paper on "Serous Tenonitis."

Personal.—Dr. Albert H. Andrews has been elected professor of otolaryngology of the Chicago Eye, Ear, Nose and Throat College.—Dr. Daniel N. Eisendrath gave a Mayo Foundation lecture at the Mayo Clinic, Rochester, Minn., April 26, on "The Clinical Importance of Renal and Ureteral Anomalies."——Dr. Carl Beck, Chicago, spoke on "Surgical Diagnosis," before the Elgin Physicians' Club, April 9.

Professions Hold Legislative Conference.—A dinner was held at the Hotel Morrison, April 23, at which nine hundred leaders of the medical, dental and pharmaceutical professions of Chicago and down state, together with members of the state legislature, outlined plans to push legislation to protect their professions and the public. They urged an amendment to the law which would transfer the appointment of examining boards from the director of the department of registration and education to the governor; that the examiners be appointed for terms of five years and that licenses be signed by the president and secretary of the board as well as by the director.——This conference was the result of the recent conviction of W. H. Miller, director of the department of registration and education, for irregularities in licensing men not qualified.

INDIANA

Illegal Practitioner Arrested.—Minnie L. Priepke, a mechanotherapy practitioner of Goshen, according to reports, was arrested on a charge of practicing medicine without a license on complaint of the secretary of the state board of medical registration and examination, April 13.

Personal.—Dr. William F. King has been appointed state health commissioner for a regular term of four years. Dr. King was first appointed to this position in August for the unexpired term of Dr. John N. Hurty, who resigned.——Dr. Carleton B. McCulloch, Indianapolis, will go to Europe as representative of the American Legion, to invite certain distinguished guests to the American Legion national convention in San Francisco, October 15-20, it was announced, March 19.——Dr. Frederick G. Banting of the University of Toronto, Canada, addressed the Indianapolis Medical Society, April 10, on diabetes and insulin. Dr. Banting stated, it is reported, there are now 3,000 patients under treatment with insulin.

IOWA

Measles Epidemic.—Seventeen new cases of measles in the epidemic at Waterloo were reported, April 9. This was the largest number reported in any one day, although the disease had been prevalent for two weeks. All parts of the city are affected, but the cases seem mild.

Personal.—Dr. Benjamin Courshon has been appointed city physician of Sioux City to succeed Dr. Max A. Helfgott, who resigned.——Dr. H. Hauneder of Vienna arrived in the United States from Austria, March 6, and will locate in New Hampton.——Dr. A. C. Conaway of Marshalltown was elected mayor of that city recently.——Drs. Raleigh A. Buckmaster, Dunkerton, and James R. Thompson, Waterloo, were elected president and secretary, respectively, of the Blackhawk County Medical Society at the annual meeting, April 4.

KANSAS

State Medical Meeting.—The fifty-seventh annual meeting of the Kansas Medical Society will be held at Kansas City, May 2-4, under the presidency of Dr. Middleton L. Perry, Topeka. Drs. William A. Pusey, George J. Musgrave, and T. Howard Plank, all of Chicago, will be the principal visiting speakers.

KENTUCKY

Health Survey.—L. K. Hospins of the U. S. Public Health Service and F. C. Dugan, sanitary engineer of the state board of health, will make a health survey in northern Kentucky to determine the cause of the prevalence of typhoid in Covington and adjacent territory.

MAINE

University News.—The governor has signed the bill appropriating $895,000 for the University of Maine for each of the fiscal years ending in 1924 and 1925. Of this amount, $170,000 will be expended for an arts and science building.

MARYLAND

Permanent Health Exhibit Planned.—Activities of the Maryland Department of Health in combating disease will be shown in a permanent exhibit to be placed in the Smithsonian Institute, Washington. Dr. John S. Fulton, director of health, and Dr. John Collinson, assistant chief of the bureau of communicable diseases, are arranging the material.

Hospital News.—The West Baltimore Medical Association has purchased the property formerly used as the Hebrew Orphan Asylum. After improvements have been made, the new hospital will accommodate 140 patients. All except contagious diseases will be treated. The hospital which will be nonsectarian, will be formally opened in the fall.——A special medical meeting in which the Maryland Psychiatric Society and the Washington Psychiatric Society participated, was held at the Henry Phipps Psychiatric Clinic, Johns Hopkins Hospital, April 18, to celebrate the tenth anniversary of the opening of the clinic.

MASSACHUSETTS

Exchange Professorships.—Sir Harold Jalland Stiles, professor of surgery at the University of Edinburgh, and former president of the Association of Surgeons of Great Britain and Ireland, arrived in New York, April 6. He will occupy the chair of Dr. Harvey Cushing of Harvard University, Boston, for one week; then spend a week at Johns Hopkins University, Baltimore. Last year Dr. Cushing acted for two weeks as director of the surgical unit at St. Bartholomew's Hospital, London.

MICHIGAN

Bill for Homeopathic School Killed in Committee.—The Senate State Affairs Committee voted, April 10, not to report out Senator Whiteley's resolution directing the regents of the University of Michigan to reestablish the Homeopathic College apart from the regular medical school, with which it was merged two years ago.

Society News.—Dr. Frederick C. Warnshuis, Grand Rapids, presented a paper on "Our Present Attitude to Gallbladder Disease," before the Kent County Medical Society, April 11.——At the annual election of officers for the medical section of the Wayne County Medical Society in Detroit, April 9, Dr. Robert C. Moehlig was elected chairman, and Dr. George P. McNaughton, secretary, for the ensuing year.

Bill to Regulate Fees.—If a bill recently introduced in the legislature is enacted, the state of Michigan will be divided into districts, and the maximum charge that may be made under any oral or implied agreement for hospital and medical services by any physician or hospital within each district will be fixed by law. If a physician charges more than the amount stated in the proposed law, his license may be revoked.

MINNESOTA

The Cancer Institute.—Further details of the gift of $250,000 for a cancer institute in connection with the University of Minnesota General Hospital (THE JOURNAL, April 21, p. 1155) have been received. The donation was made by the Citizens Aid Society of Minneapolis, established in 1916 by the late George H. Christian; $200,000 will be expended in the construction of a suitable building; and the remainder, on radium and roentgen-ray equipment. The institute will have a capacity of fifty beds and will operate on a self-supporting basis. Construction work will start at once.

Physiologists Meet at Rochester.—In order to correlate further the teaching of physiology and its clinical application, physiologists from nearby medical schools met at the Mayo Foundation, Rochester, April 9-11. The following were present: Dr. Frank C. Becht, Northwestern University; Prof. Charles W. Greene, University of Missouri; Prof. August E. Guenther, University of Nebraska; Dr. Don. R. Joseph, St. Louis University; Dr. Arno B. Luckhardt, University of Chicago; Drs. Elias P. Lyon, George E. Fahr, and Prof. Jesse F. McClendon, University of Minnesota; Dr. John T. McClintock, University of Iowa; Dr. James F. McDonald, Creighton University; Prof. W. J. Meek, University of Wisconsin, and Prof. Percy F. Swindle, Marquette University.

MISSOURI

Medical Society to Aid Cripples.—The St. Louis Medical Society recently passed a resolution to repeat last year's survey in order to ascertain how many crippled children in and about St. Louis are not receiving corrective treatment because of the inability of their parents to pay, and to renew its offer to provide free medical, surgical, hospital or appliance treatment for those children. Last year the society received the names of crippled children from seven states outside Missouri. The committee on public health and instruction of the medical society inquires into the cases reported and the parents of the children are notified to present them at a three-day clinic at the medical society's offices in St. Louis.

MONTANA

Volunteers for Spotted Fever Serum.—It is reported that nine Japanese of Missoula responded to a call for volunteers for trying out the immune serum recently produced by Dr. Hideyo Noguchi for the treatment of Rocky Mountain Spotted Fever (THE JOURNAL, April 21, 1923, p. 1146). A second injection of serum was administered, April 12.

NEVADA

Hospital News.—It is planned to erect a new ward for the Nevada Hospital for Mental Diseases, Reno, at a cost of approximately $40,000.——Dr. Claude H. Church, Tonopah, has been appointed medical director and superintendent of

the Ross Sanatorium, Ross, Marin County, Calif.——A new eighteen bed hospital will be erected in Central City at a cost of $35,000.

NEW JERSEY

Chiropractor Fined.—The state board of medical examiners reports that Roy H. Langley, chiropractor, of Bound Brook, was fined $200 and costs, following conviction on the charge of practicing medicine without a license.

NEW YORK

Women's State Medical Society Meeting.—The Women's Medical Society of New York State will hold its eighteenth annual convention in New York City, May 21, just preceding the meeting of the Medical Society of the State of New York.

Hospital News.—An addition will be erected to the Niagara Falls Memorial Hospital at a cost of $250,000.——The South Side Hospital, Babylon, will move into its new $300,000 building, May 31.——The cornerstone of the new $500,000 wing of the Jewish Hospital, Brooklyn, to be known as the Abraham Memorial, was laid, March 24. The hospital has taken title to sixteen lots adjoining the new wing; these will be transformed into a playground and recreation park.

New York City

Roentgen-Ray Society Organized.—The Manhattan Roentgen-Ray Society was organized, March 28. The following officers were elected: Dr. Charles Gottlieb, president; Drs. Jose S. Smul and Harry Reinstein, vice presidents; Dr. Louis Greenwald, secretary; Dr. Lessof, treasurer; Dr. Michael Spinrad, historian; Drs. Max Beegel, Benjamin Goldstein, Tobias Weinberg, Samuel Gellert and Jacob Abowitz, executive committee.

Auditorium for Hospital.—An auditorium for free lectures on hygiene, sanitation and the prevention of disease, will be part of the equipment of the new Beth Israel Hospital, at Sixteenth Street and Livingston Place. For this purpose the Federation for the Support of Jewish Philanthropies has increased the budget allowance for this hospital by $15,000. The new building will have six floors of private rooms for adult patients and a children's ward containing 104 separate glass-walled compartments.

Floating Hospital Begins Treating Tuberculous Children.—Bellevue Hospital has begun the treatment of fifty schoolchildren on a boat in the East River off Twenty-Eighth Street. Physicians from the hospital and two teachers from the public schools have been detailed to the craft. The children report at 9 o'clock in the morning and receive breakfast and dinner on board. A roentgen-ray department and a surgical dressing room have been provided. It is intended to establish a nursery, and a department for tuberculous men and women on board. Dr. James Alexander Miller is director of the work.

Course in Child Conservation.—Child conservation will be stressed at the Columbia University Summer Session. Under the direction of Dr. Haven Emerson, instruction in the principles and practice of medical inspection of schools and schoolchildren will be provided for physicians daily for six weeks from 10 a. m. to 12 noon, at the School of Medicine. Public health and standards of living will be discussed in a sociologic course directed by Professor Chaddock, the emphasis being placed on measures to promote infant and child welfare, to improve the health of schoolchildren and to protect, at all stages of their industrial life, the workers in industries. Prof. W. H. Woglom will direct a course in cancer research at the Crocker Laboratory, 1445 Amsterdam Avenue.

OHIO

Chiropractor Convicted.—J. H. Cramblett, chiropractor of Newark, recently convicted on a charge of practicing medicine without a license, was committed to the county jail, April 6, in lieu of paying a fine of $25 and costs, it is reported.

Discharge of Patients Defended.—In a report recently submitted to the state welfare director by the acting superintendent of the Dayton State Hospital, the actions of superintendents of the various state hospitals for the insane, in discharging patients who have been cured, was defended. The report stated that if the officers of state institutions were compelled to refrain from discharging all patients who have threatened homicide or suicide during an attack of mental trouble, double the number of state hospitals would be needed.

Cornerstone of Medical School Laid.—The cornerstone of the new Western Reserve University Medical School, Cleveland, was laid on the site of the new "health" group on Euclid Avenue, April 18, by Dr. Carl A. Hamann, dean of the school of medicine. Prof. William T. Corlett, London, England, and James D. Williamson, acting president of the university, gave addresses. The school of medicine, which will be a four-story building, is expected to be ready for occupancy, Feb. 1, 1924. It is the gift of Samuel Mather, who donated for this purpose $2,500,000.

"Mentally Defective" Defined.—A bill recently introduced in the general assembly authorizes boards of education to arrange for special school classes for mentally defective and feebleminded children and children with speech defects, and to report their names annually. These boards would enter into an agreement with the Bureau of Special Education, Miami University, or any state supported teachers' college, to examine and classify the children, and would empower the director of education to contract with these colleges to inspect and supervise the equipment, appointments and instructional forces of all special classes. These classes would be formed in districts in which ten or more mentally defective children reside; twenty or more border-line and delinquent children, or fifty or more children with speech defects. Expenses would be met from the state school equalization fund. For the first time, the *Ohio State Medical Journal* states, a legislative proposal attempts to define what constitutes a mentally defective child:

> Children of school age who are subject to a serious and permanent condition of arrested brain development and of defective intelligence dating from birth or from early life, by reason of which even the highest grades of those thus affected are rarely able to do satisfactory all-round third grade work, and rarely reach an intelligence development beyond 9 years, and rarely acquire sufficient judgment and competency to lead an independent existence in society or to manage for themselves or their affairs, without the need of external guidance, supervision or support, and who ordinarily constitute less than 1 per cent. of the pupils enrolled in the elementary grades.

OREGON

Personal.—Dr. and Mrs. Horace P. Belknap, Prineville, who recently celebrated their thirty-fifth wedding anniversary, have three sons, Drs. Horace P. Belknap, Nampa, Idaho, and Leland V. and Wilford Belknap, of Portland, practicing physicians. A fourth son, Hobart, is a junior medical student in the University of Oregon.——The French Medaille d'Honneur des Epidémies has been awarded to Dr. Frank R. Mount of Oregon City, for services in France during the World War.

PENNSYLVANIA

The Bedford Lectures.—The Pittsburgh College of Physicians held its annual dinner, at which the second Bedford lecture was given, April 26. Dr. Sydney R. Miller, Baltimore, spoke on "The Future of Our Profession." Dr. Hunter H. Turner presided.

Allegheny County Medical Society.—At the annual meeting and banquet of this society at Pittsburgh, April 10, Dr. Ernest W. Willetts was elected president; Dr. Evan W. Meredith, first vice president; Dr. William H. Mayer, secretary, and Dr. Elmer E. Wible, treasurer. Dr. Charles H. Miner, state health officer, stated that it was hoped at the next legislative session to pass a measure reorganizing the health administration of third class cities, so the law will require boards of health to employ physicians as health officers. Dr. Lawrence Litchfield and Dr. Howard C. Frontz, president and president-elect, respectively, of the state medical society, gave addresses.

Philadelphia

Research Institute Opens.—The formal opening of the laboratories of the Research Institute of Cutaneous Medicine was held, April 26, with Dr. David Riesman presiding. Dr. Udo J. Wile of the University of Michigan gave the opening address. Dr. Jay Frank Schamberg is director of the institute.

John Scott Medal Awards.—The John Scott Medal Awards were presented at a special meeting of the American Philosophical Society, April 10, as follows: Dr. C. Eijkman of the University of Utrecht, for research on dietary diseases; Arthur Louis Day, Ph.D., Carnegie Institution, Washington, D. C., for research on optical glass; Sir Joseph Thomson, master of Trinity College, Cambridge, for research on the physics of the electron, and Francis William Aston, F.R.S., of Trinity College, Cambridge, for his development of the mass-spectrograph. Dr. Hobart A. Hare represented the board. These awards are made annually by the city of Philadelphia, from the income of the John Scott fund, on recom-

mendation of a committee of five, consisting of representatives from the National Academy of Science, the American Philosophical Society, and the University of Pennsylvania.

RHODE ISLAND

Medical Meetings.—At the annual banquet and meeting of the Pawtucket Medical Association, March 15, Dr. Frank E. Peckham, Providence, president of the Rhode Island Medical Association, was the principal speaker. The following officers were elected: president, Dr. Stanley Sprague; vice president, Dr. Edward Duffee, and secretary, Dr. George E. Rönne.——Dr. Donald A. Farnum of the Boston Psychopathic Hospital spoke on "Mental Hygiene and Adolescence" before the Rhode Island Mental Hygiene Association and the Rhode Island Congress of Mothers, at Providence, March 22.

TENNESSEE

Personal.—Dr. James H. McCall, Huntingdon, has been appointed instructor in the medical department of the University of Tennessee, Memphis.——Dr. W. S. Quinland, head of the department of pathology, Meharry Medical College, Nashville, has been elected a member of the American Association of Pathologists and Bacteriologists.

State Medical Meeting.—At the ninetieth annual meeting of the Tennessee State Medical Association, held in Nashville, April 10-12, under the presidency of Dr. Holland M. Tigert, Nashville, the following officers were elected for the ensuing year: president, Dr. Hampton L. Fancher, Chattanooga; treasurer, Dr. J. Owsley Manier, Nashville, and secretary, Dr. Joseph F. Gallagher, Nashville. Knoxville was selected for the next annual meeting.

TEXAS

Child Guidance Clinic.—More than 300 persons attended the first reception to the public, held by the Dallas Child Guidance Clinic, April 5. This is the third of eight demonstration clinics to be established in various parts of the country by the Commonwealth Fund of New York in cooperation with the National Committee for Mental Hygiene for the study of juvenile delinquency. The Commonwealth Fund bears the expense for the first six months, following which the service will be continued under local direction.

UTAH

Limitation of Medical Fees.—A new schedule of medical and surgical fees, and rules governing them, was promulgated by the Utah State Industrial Commission to take effect April 1. The schedule presents the maximum fees that are ordinarily allowed by the commission, but on satisfactory evidence of extraordinary difficulties the commission may allow higher fees. Regardless of the maximum established by the regulations, all fees are to be limited to the prevailing charges in the community where the service is being performed, for similar treatment of injured persons of like standards of living. One of the rules relating to fees to be paid for operations provides that if the case terminates fatally within seven days after the operation, only one-half of the fee will be allowed.

WEST VIRGINIA

Personal.—Dr. George E. Mills, Hopemount, has been appointed resident physician of the Irene Byron Tuberculosis Sanatorium at Fort Wayne, Ind., to succeed Dr. Doster Buckner, who will resign, May 1, to resume private practice.

WYOMING

New State Health Officer.—Dr. George M. Anderson, Casper, has been appointed state health officer and secretary of the Wyoming State Board of Health to suceed Dr. Albert B. Tonkin of Cheyenne who resigned recently.

CANADA

Personal.—Dr. Frederick G. Banting, Toronto, will be appointed to a chair in medicine at the University of Toronto if plans of the university and the provincial government materialize. An annual allowance of $10,000 accompanies the appointment, $6,000 being for salary, and the remainder for supplies, assistants, and other expenses.

Public Health News.—The epidemic of typhoid fever which has been spreading over northern Ontario during the past few weeks has reached a critical point. To date 750 have been reported, with twenty-four deaths. New cases are being reported at the rate of five a day. The cause of the outbreak, polluted water, at Cochrane, Ont., where the majority of cases have occurred, has been eliminated, and a rapid decrease in the number of cases is expected. At present there are fifty graduate nurses from Toronto in Cochrane, and also a number of nonresident physicians. The town of Cobalt, Ont., recently made a grant of $1,000 to be spent in combating the epidemic in Cochrane.——An outbreak of smallpox has been reported from North Sydney, N. S., thirty cases being recorded. The spread of the disease is said to be due to the lack of proper medical supplies, the district being isolated.——Application has been made to the Ontario Medical Association by about 260 Ontario physicians for admittance to the insulin clinics in the Toronto (Ont.) General Hospital. These physicians will be given, in groups of twenty, two days of observation and instruction. It is thought that one of the results of this plan will be that diabetic patients will not be obliged to remain for as lengthy periods at the Toronto General Hospital. The local practitioners will be enabled to administer insulin after leaving the hospital.

GENERAL

Swindler Apprehended.—F. S. Miller, whose plan to obtain money from leading surgeons in several cities was noted in THE JOURNAL, Feb. 24, 1923, p. 563, was taken into custody in Dubois, Pa., on a charge of forgery. He obtained $250 from the Braddock National Bank. Miller operated, it is said, in York and Braddock, Pa.; South Bend, Mishawaka and Huntington, Ind.; Louisville, Ky.; Alliance, Ohio, and other places.

Northern Tri-State Medical Association.—The fifteenth anniversary of the Tri-State Medical Association (Michigan, Indiana and Ohio) was held in Cleveland, April 10-11, under the presidency of Dr. G. M. Livingston, Detroit. The following officers were elected for the ensuing year: president, Dr. Harry F. Mitchell, South Bend, Ind.; vice president, Dr. C. W. Waggoner, Toledo, Ohio; treasurer, Dr. A. Joseph Weitz, Montpelier, Ohio, and secretary, Dr. Charles W. Haywood, Elkhart, Ind.

Epidemic Encephalitis.—A total of 575 cases of epidemic (lethargic) encephalitis was reported to the U. S. Public Health Service during the first three months of 1923. The disease was most prevalent in the week ending, March 3, when sixty-nine cases were reported. The total for the week of March 31 was thirty-seven. Public health officials said these figures were not exact since physicians in many cases have confused epidemic encephalitis with meningitis and other diseases. One case recently reported proved to be coma due to a mastoid infection.

FOREIGN

Plague in India.—According to reports, plague is prevalent in nearly all the provinces of British India. For the week ending March 24, 9,000 new cases were reported with 8,000 deaths. The death rate is especially heavy in the central provinces, the United Provinces, Bombay Presidency, the Punjab, and Delhi.

Campaign Against Syphilis in Belgium.—The propaganda against syphilis in Belgium has assumed the proportions of a crusade. The king and queen head a list of subscriptions for funds for carrying out propaganda and establishing laboratories all over the country. The fund started two years ago now amounts to 400,000 francs. During the war, it is said, syphilis assumed alarming proportions in Belgium, but a diminution in the amount of syphilis can already be noted.

Hospitals for the Slightly Sick.—The *Deutsche medizinische Wochenschrift* reports that the new arrangement of hospitals for persons that are not seriously ill is proving extremely satisfactory. A number of sanatoriums are being converted into these *leichtkrankenhäuser*, the maintenance of which is much less expensive than the general hospitals. Some are arranged for men, some for women and some for children. The arrangement relieves the general hospitals and the institutions for children. The Blankenburg sanatorium has been transformed to an institution for children with chronic affections.

Medical News from Siam.—Dr. M. E. Barnes, director for Siam for the International Health Board of the Rockefeller Foundation, writes that 332,076 treatments were given in the antihookworm campaigns recently conducted by the Interna-

tional Health Board and the Siamese Red Cross Society.——At a conference of Red Cross Societies, recently held in Bangkok, Siam, delegates were present from the British, American, Japanese, Chinese, French, Philippines, Dutch East Indies and Siamese Red Cross societies, the League of Nations, the International Committee of Red Cross Societies, the British Colonial Office, the Rockefeller Foundation, the China Council of Health Education and the Department of Public Health of Siam. A health exhibition of two weeks' duration followed the conference.——The Rockefeller Foundation is providing the following fellowships for candidates from Siam: public health, one physician studying at Johns Hopkins School of Hygiene and Public Health, Baltimore; nursing, one candidate in Peking Union Medical College School of Nursing; leprosy, one physician studying in the Philippines.——A recent survey showed that there are approximately 8,000 cases of leprosy in the kingdom of Siam. The infirmary conducted in Chiengmai by Dr. J. W. McKean, now receives a subsidy from the government, and another leprosarium, under construction near Bangkok, will be opened in April, under the auspices of the Siamese Red Cross Society.——The Siam Medical Association, enrolling 300 physicians, held its second annual session in January.——The following American physicians working in Siam have received decorations from the Siamese government for special services rendered: Ira Ayer, adviser to the department of public health; R. W. Mendelson, medical officer of health, Bangkok, and M. E. Barnes.

Deaths in Other Countries

Dr. J. **Llewellyn Rees** of Pontardawe, March 4, aged 58.——Dr. H. **W. McCaully Hayes** of Madras, recently.

Government Services

Public Health Service Extends Radio Activities

Since March 15, the number of radio stations cooperating with the U. S. Public Health Service has trebled. There is now scarcely a section of the country that is not within range of at least one broadcasting station which releases health bulletins furnished by the federal service. During the first six months of its existence it is estimated that this service reached 27,000,000 people in the United States alone. There are more than 2,000,000 radio receiving sets within range of stations releasing these health bulletins. The Public Health Service has the distinction of being the first government agency in the world to inaugurate an education-by-radio service.

Hospitals Authorized

Pursuant to instructions of the Secretary of War the organization of General Hospital No. 27, organized reserves (School of Medicine, University of Pittsburgh Unit, Pittsburgh), and of Veterinary Station Hospital No. 2 (Seventh Corps Area Unit), has been authorized.

Hospital Train Authorized

Pursuant to instructions of the Secretary of War, the organization of a hospital train, to be known as Hospital Train No. 4 (Alabama State Unit), has been authorized.

U. S. Public Health Service News

Dr. Boyd R. Sayers, surgeon, U. S. Public Health Service, has been directed to proceed to Melbourne, Australia, to attend the meeting of the Pan-Pacific Scientific Congress to be held in Melbourne in August. He will then proceed to Johannesburg, South Africa, to study phthisis problems on the Rand, returning via London, England, for conference with experts in London and at the British mine rescue stations.——Dr. Louis L. Williams, Jr., surgeon, U. S. Public Health Service, has been directed to proceed, about May 1, to Rome, Italy, and other points in that country, for duty in connection with field investigations of malaria.——Dr. Dana E. Robinson, surgeon, U. S. Public Health Service, has been relieved from duty at the Immigration Station, Philadelphia, and assigned to the Quarantine Station, San Juan, Porto Rico.

Foreign Letters

LONDON

(From Our Regular Correspondent)

April 2, 1923.

Criminal Responsibility

As shown in previous letters the question of criminal responsibility is in a very unsatisfactory state and is constantly giving rise to difficulties in the administration of the law. Three months ago, a committee appointed by the Medico-Psychological Association, consisting of leading psychiatrists, particularly those experienced in prison service, began work on the question of responsibility of criminals. It has issued an important report, which has been sent to a committee of judges appointed by the lord chancellor to consider whether any change should be made in the law relating to criminal trials when the plea of insanity is raised. The committee has unanimously concluded that: 1. The criteria of responsibility expressed in the rules in M'Naghten's case should be abrogated, and the responsibility should be left as a question of fact to be determined by the jury. 2. In every trial in which the prisoner's mental condition is at issue, the judge should direct the jury to answer the questions (*a*) Did the prisoner commit the act alleged? (*b*) If he did, was he at the time insane? (*c*) If he was insane, has it been proved that his crime was unrelated to his mental disorder? 3. When a prisoner is found unfit to plead, the trial, on the facts, should be allowed to proceed. 4. The verdict "guilty but insane" should rank as a conviction for purposes of appeal. 5. A panel of experts should be appointed, any of whom can be called to give evidence when insanity is raised as a defense.

The M'Naghten rules are declared not wrong in holding that irresponsibility was only an inference that might or might not be drawn from insanity. Where they erred was in attempting to define precisely the conditions under which the inference was legitimate. They identified responsibility with knowing and reasoning; whereas, any physician with experience of the insane must know many persons as to whose insanity (and irresponsibility) there could be no possible doubt, who had realized the nature and quality of their act, had known that it was contrary to law, human and divine, and had shown remarkable cleverness in carrying out their object. Since 1843 (when the M'Naghten rules were propounded), there has been a definite change in the medical view as to what constituted insanity. Unsoundness of mind is no longer regarded as in essence a disorder of the intellectual faculties. The modern view is that it is something much more profoundly related to the whole organism—a morbid change in the emotional and instinctive activities with or without intellectual derangement. Long before a patient manifests delusions or other signs of obvious insanity, he may suffer from purely subjective symptoms. These are now recognized to be no less valid and of no less importance than the more manifest signs of the fully developed disorder, which may take the form of delusions, mania, melancholia or dementia. The law should be so framed as to allow the medical witness to make it clear that the facts observed by himself, supplemented by other evidence before the court, formed in his mind a coherent picture of mental disorder; and he should be in a position to state that the prisoner's act was symptomatic of such a condition, or at least consistent with it. His evidence should enable the jury to find that, even if there should be no logical connection between the mental derangement and the crime, it was reasonable to conclude that both formed part of the mental unsoundness,

and it was important that the evidence be placed before the jury as fully as possible.

The Rockefeller Gift

Presiding at the annual meeting of the Corporation of University College Hospital, Sir Ernest Hatch referred to the munificent gift of the Rockefeller Foundation of $6,000,000 for a scheme of extension, in order to provide additional clinical material for educational purposes. In view of the international character of this gift and the importance of its object—to improve medical education in the capital of the country—the king and queen will lay the foundation stones of the new hospital buildings presented by the Rockefeller Foundation, at the end of May.

William Pearson

Though some other countries may have surpassed this in the size or in the organization of their industries, probably there is none which can compare with it in the production of highly skilled craftsmen. One such was William Pearson, formerly prosector of the museum of the Royal College of Surgeons, who has passed away at the age of 83 years. He worked there for almost fifty-eight years, and made preparations which are known all over the world for their unique excellence. He was the third in the line of grandfather, father, and son who served the museum for 153 years. As a boy of 15, he entered the institution as an attendant. He served in turn under the conservators Owen, Quekett, Flower, Stewart and Keith, under thirty-three presidents, respected by all not only for his skill but also for his character. His great success was due not only to high manual dexterity but to a thorough knowledge of anatomy, human and comparative, which he acquired in his work. He was indeed an artist.

Abolition of Cocain

In a letter to the *Times*, Prof. W. W. Bayliss and Dr. C. W. Saleeby state that the abolition of the use of cocain by international action is the only effective means of ending the evils to which the drug gives rise, and that this is now feasible without detriment to surgery. All methods of control have failed everywhere. So long as the drug is manufactured, it will be misused. According to leading dental surgeons, cocain is no longer needed in dentistry, completely effective substitutes, such as procain, being available. A new synthetic substitute known as butyn has also been widely tested with good results. Like procain, it has no action on the central nervous system. International action should therefore be taken to end the present manufacture of cocain in Germany and Switzerland, and the cultivation of the coca plant in Peru, Java and Bolivia. The best instrument for such action, given an instructed and active public opinion in the various countries concerned, is the Opium Committee of the League of Nations. Though neither the United States nor Germany is as yet a member of the league, both countries are represented on the Opium Committee.

Lord Byron's Lameness

Perhaps the two persons in the modern world whose lives have attracted the greatest interest are Napoleon and Lord Byron, and this is not the only link connecting these great men, for the poet in some of his best known verses described the downfall of Waterloo and was, as he tells us, dubbed "the grand Napoleon of the realms of rhyme." At the Royal Society of Medicine, Dr. H. C. Cameron delivered a most interesting address on Byron's lameness, showing that it was not due to clubfoot, as is commonly supposed. By the kindness of Mr. John Murray, the present head of the firm which published Byron's works, he exhibited two surgical boots worn by Byron when a boy. They were both made for the right foot. They showed that this foot was long and slender, and in no way resembled a clubfoot. The lasts on which his shoes were made are in the Nottingham Museum; they show feet which were symmetrical and well formed.

In 1858, Trelawny published "Recollections of the Last Days of Shelley and Byron." He had been a friend and companion of Byron, who wrote of him that he could not tell the truth to save his life. After Byron's death, he examined his feet and described them as clubbed and his legs withered to the knee. But when, in his eighty-sixth year, he republished the book, he replaced that description by this: It was caused by the contraction of the back sinews, which physicians call the Achilles tendon, which prevented his heels touching on the ground and compelled him to walk on the fore part of his feet; except for this, his feet were perfect. Dr. Cameron thought that the first description was what the public expected and wanted to hear, but that as Trelawney drew near death he did not like to go down to his grave with the lie unwithdrawn. Dr. Cameron concluded that Byron's lameness was due to Little's disease. This is borne out by Trelawney's description: "To hide his lameness, he always entered a room quickly, running rather than walking. In the streets he moved with a peculiar sliding gait—with the gait of a person walking on the balls and toes of the feet." Finally, sufferers from Little's disease are prone to convulsive seizures like those of epilepsy, and Byron toward the close of his life had such attacks.

Reform of Mental Treatment

At the annual meeting of the Mental After-Care Association, the lord chancellor, Lord Cave, said that few things were more pathetic than the position of one who had suffered from a mental disease, had been cured, and was sent out into the world without relatives or friends. The position of those who needed mental treatment, or who were recovering from mental affliction, had been engaging the special attention of the government. Better machinery for the mental treatment of those cases which were still of a doubtful character and which might be easily curable was required before resort was had to the machinery of the law. Proposals would shortly be made under which treatment could be given without certification.

Treatment of Venereal Diseases

The Public Health Committee of the London County Council announces that the new cases dealt with at the clinics last year numbered 17,762, as compared with 19,368 in 1921, and 24,454 in 1920, while the total number of attendances was 527,635, as against 496,209 in the previous year. The committee is of opinion that the decrease by 1,379 in the number of new cases of syphilis may be attributed in no small measure to the work of the clinics. The steady and great increase in the number of attendances is regarded as striking. It shows an increased disposition of the patients to continue attendance for the treatment which they are advised is necessary.

The Panel System

As shown in previous letters, there is considerable friction between the friendly societies and the panel physicians. The insurance act has turned out very different from what was anticipated. In a statement to the *Times*, Sir Kingsley Wood, a representative of the societies, has put forward their case. The fact that they have been called on to make further contributions from their funds has created a new situation. At the end of the year, the agreement with the physicians comes under review and the societies naturally have a considerable interest in the revised terms. The medical profession has indicated that it will not meet the societies to discuss terms; it will confer only with the government. The minister of health has stated that he will not conclude any agreement

without consulting the societies. The circumstances appear to call for a conference between officers of the health ministry and representatives of the panel physicians and of the societies. Sir Kingsley Wood holds that, while the majority of physicians are carrying out their duties in the spirit of the regulations, there is much complaint as regards some of them. In too many cases, a panel patient is treated differently from a private one, although the medical regulations contemplate no distinction. Cases constantly arise in which the panel patient is unable to get in touch with physicians, especially in the case of those who provide "lock-up surgeries" (offices). There are also complaints of inadequate waiting-room accommodations.

The question of provision for surgical operations is bound up with the hospital question. To a large extent, the hospitals are solving the problem on their own account. A large number of persons now contribute to the hospitals, and many of them become paying patients. The exact position of the hospitals under the insurance act remains to be determined. There was not much possibility that the medical profession would go back to the condition obtaining before passage of the act, when the societies made their own arrangements with the physicians. Improvement of the panel service was the best course.

PARIS

(From Our Regular Correspondent)

March 30, 1923.

The Milk Consumed in Paris

The veterinary inspection service of Paris and the department of the Seine has just published a report on the milk consumed in Paris. The first point worthy of note is the frequency of tuberculosis in milch cows. Of 15,637 milch cows subjected to the tuberculin test in recent years, 5,375, or 34.35 per cent., gave a positive reaction. The percentage of tuberculous cows varies considerably from year to year, but no frank tendency toward a decrease can be noted as yet.

The bacterial count in the milk examined gives startling results. In fifty-nine specimens examined, the bacterial count resulted as follows: Forty-two, or 75 per cent., contained more than 10,000 bacteria per cubic centimeter; thirty-five, or 62 per cent., contained 50,000 bacteria per cubic centimeter; twenty-nine, or 52 per cent., 100,000 bacteria per cubic centimeter; twelve, or 21 per cent., 500,000 bacteria, and four, or 7 per cent., contained more than one million bacteria per cubic centimeter. If we recall that hygienists regard as bad, or impotable, water that contains more than 10,000 bacteria per cubic centimeter, it will be observed that 75 per cent. of the milk examined came under this head.

M. Chrétien, chief of the milk inspecting service, has endeavored to evaluate not only the number of bacteria but also the apparent cleanliness of the milk inspected. The impurities are estimated by a special filtration procedure, and the specimens are divided into four categories: clean milk, fairly clean milk, dirty milk and very dirty milk, this classification being made on a somewhat arbitrary basis, as far as any fixed standard is concerned. Out of 111 specimens so examined, ten, or 9 per cent., were found clean; twenty-seven, or 24.32 per cent., fairly clean; forty-six, or 41.44 per cent., dirty, and twenty-eight, or 25.22 per cent., very dirty.

The Fight Against Tuberculosis

The annual general meeting of the Comité national de défense contre la tuberculose, at the head of which is M. Léon Bourgeois, was just held under the chairmanship of M. Paul Strauss, minister of hygiene, public charity and social welfare. Prof. Léon Bernard traced, in an address, the history of the antituberculosis movement in France, which controls at present 420 dispensaries, located in seventy-three different departments. The American Red Cross and the Rockefeller Foundation have, in recent years, given this movement most active and generous aid. The Comité national has decided, with the aid of educational propaganda, to undertake the creation of new dispensaries and the recruiting of visiting social welfare workers, who are the chief reliance of organizations of this character. I will mention, in this connection, that the minister of public health had been authorized by the council of ministers (the French cabinet) to present to the chamber of deputies proposed legislation providing for the rendering of state aid to preventoriums for the purpose of checking the spread of tuberculosis among children under 16 years of age.

The Law Against Abortion

A law modifying Article 317 of the Penal Code, with a view to increasing the penalties against abortion, has recently been promulgated. The new law imposes the following penalties:

1. Whoever shall be found guilty of causing abortion, or endeavoring to cause abortion, in a pregnant woman, shall be amenable to imprisonment for from one to five years, and to the payment of a fine of from 500 to 10,000 francs.

2. Any woman who shall have brought about abortion in herself shall be punishable by imprisonment for from six months to two years, and by the payment of a fine of from 100 to 2,000 francs.

3. Physicians, public health officers, midwives, dental surgeons, pharmacists; likewise students or pharmaceutical employees, herbalists or dealers in surgical supplies and instruments, who shall have pointed out, recommended or practiced means of abortion shall suffer the penalties imposed in Section 1. Furthermore, the court may, at its discretion, suspend temporarily or deprive permanently any such offenders of the right to practice their calling or profession.

The Colonial Laboratories

The Comité de propagande de l'institut colonial français, of which M. René Besnard, senator and former minister for the colonies, is the chairman, has, at the suggestion of M. Georges Barthélémy, member of the chamber of deputies, and of Dr. Nattan-Larrier, professor at the Collège de France, called the attention of the minister for the colonies and the head of public instruction to the precarious situation of the colonial laboratories, and, more particularly, of the laboratories for microbiology and colonial hygiene, and has expressed the hope that, if funds and subscriptions are collected in aid of the laboratories of France, a portion of such funds may be reserved for the colonial laboratories.

Defense of Wine as a Beverage

Those who, as Dr. Linossier characterized this class recently, "have been reared from childhood with the false idea that wine is a generator of energy and strength quite indispensable to manual laborers and mental workers alike" (THE JOURNAL, Feb. 17, 1923, p. 490), cannot rest content merely to crack their little jokes on the subject of prohibition in the United States. Dr. C. Chauveau, senator from Côte-d'Or, a department well known for its wines, has therefore felt constrained to publish two articles in defense of wine as a beverage, to which he has affixed the title, Pro Vino. In the *Concours médical,* Dr. J. Noir endorses Chauveau's pleading and expresses himself thus: "At a time like this, when the United States of America is rigorously closing its borders to all fermented beverages, including the good wines of France, we are justified in taking up the defense of wine." In presenting his defense, he invoked the antiquity of wine as a beverage—the place it has held in both legendary and religious history—the cult of Dionysus, etc. His arguments have all about as little force as the affirmation of Dr. J. Guyot, who states that he is "profoundly convinced that the wines of France are the primary cause for the liberty-loving nature, the generosity and the moral worth of the French people."

Now for the "therapeutic" argument. Noir even feels called upon to employ a word taken from the Greek to

designate the therapeutic use of wine: *oinotherapy*. Fortunately, he disclaims any intention of making of oinotherapy any general therapeutic system, with which to cure all forms of disease. But, he adds, in view of the fact that the physicians in bath resorts famous for their mineral springs have succeeded in making a veritable science out of hydrology, why shouldn't the practitioners of regions famous for their viniculture do as much for oinotherapy? Verily, all things are provable from analogy.

Scottish Students in Paris

Sixty-one Scottish students, forty-six men and fifteen women, have recently come to Paris to pursue courses in obstetrics. They were welcomed at the Faculté de médecine by Dean Roger, together with three professors of clinical obstetrics—Couvelaire, Brindeau and Jeannin. The day following, the medical section of the general association of students organized a reception in honor of the Scottish contingent. At this reception, the dean of the medical faculty presided, aided by the aforementioned professors of clinical obstetrics; likewise the heads of the clinic, and the interns and externs of the obstetric services. The dean, in his welcoming address, expressed his satisfaction at having received from the University of Edinburgh the title of doctor *honoris causa*. He gave word also to his appreciation of the warm welcome the students of the University of Edinburgh accorded last July to the visiting French professors and students.

Another Victim of Roentgen Rays

Dr. Soret, a roentgenologist in Havre, aged 69, was one of the first to use roentgen rays. In May, 1914, he had to undergo an operation on the left hand, and recently he suffered the amputation of the right index finger.

Death of Dr. Toubin

Dr. Toubin, the oldest physician in France, has just died at Salins-du-Jura, at the age of 97.

BUDAPEST

(From Our Regular Correspondent)

March 20, 1923.

Compulsory Vaccination in Hungary

The supreme court of justice of Hungary last month handed down a decision in a case that had been appealed from the Budapest court respecting a ship's officer on a Danubian steamer, who refused to be vaccinated, when coming from a Roumanian port during an outbreak of smallpox. The refusal was based on the ground that the operation, compulsorily enforced, was an infringement of personal liberty. The supreme court denied the appeal and affirmed the judgment of the lower court. The judge in giving the decision said that society based on the rule that each one was a law unto himself would soon be confronted with anarchy. Real liberty could not exist under the operation of a principle that recognizes the right of each individual to use his own will in respect to his person or property, regardless of the injury that may be done to others. It is the acknowledged power of a local community to protect itself against an epidemic threatening the safety of all, and to exercise that right in particular circumstances and in reference to particular persons.

Annual Report on the Health of the City of Budapest

The statistical bureau has just issued a report for the year 1922. The population of the city is 1,113,468, a density of 39.07 per acre. The birth rate was 21.42, and the death rate 18.04. About one in every four deaths was of a child under 1 year, or 125 for each thousand births. The zymotic death rate was 1.14 per thousand. The birth rate affords little reason for gratification; it has been heavily falling since 1901, when it was 28.89 per thousand, and at present it is lower than in any of the large cities of central Europe. To compensate for this, the low annual death rate constitutes a record in the annals of the city. The age distribution of the deaths was much the same as in former years. On the whole, the city has been comparatively free from serious zymotic diseases, but whooping cough and diphtheria have been more prevalent and attended with a greater mortality than in the previous year or two. Deaths from tuberculosis show a slight but definite decline. Deaths from cancer remain fairly stationary. During the last six years, the number of cases was 2,143, of which 57 per cent. occurred in women. More than a third of all deaths from cancer occurred from cancer of the esophagus, stomach, intestine or rectum. Cancer of the liver accounted for 213 deaths; of the breast, 189, and of the face and neck, 218. Of the last two mentioned, women predominated in the former in the ratio of 186 to 3, men in the latter in the ratio of 167 to 51.

Bilateral Herpes Zoster

Dr. Konrad, at a medical meeting in Szolno, exhibited a boy, aged 11, seen, February 17, who five days previously had had an eruption of herpes on his face, preceded by some neuralgia. The patches of herpes covered the submaxillary regions on both sides; the auricles were red, and a few herpetic vesicles were present along the margins of the right pinna and tragus. There was slight enlargement of the lymphatic glands beneath the chin. Exceptions to the unilateral distribution of herpes zoster are distinctly rare. The peculiarity of this case was its abundant distribution over symmetrical parts of the two sides of the face. About the ears there was definite inflammatory reaction. No lesions were seen on the buccal mucous membrane.

Menstrual Jaundice

Dr. Konrad also related a history of a case of menstrual jaundice. A healthy woman, aged 43, shortly before the commencement of a menstrual period regularly became jaundiced. Dr. Konrad discussed the connection between menstruation and jaundice, and pointed out that latent gallstone trouble would react with an attack during menstruation; in the case presented there was no evidence of gallstones. Senator, in explanation of his cases, assumed a hyperemia of the liver causing pressure on the bile ducts, with consequent stasis of bile. Others who had encountered such cases thought it was a functional disturbance of the liver cells. Dr. Konrad concluded that, in his case, the jaundice was caused by reflex contraction of the bile ducts.

BERLIN

(From Our Regular Correspondent)

March 17, 1923.

Study of the Brains of Eminent Scientists, Musicians, Statesmen and Scholars

Professor Maurer, the anatomist, of Jena, has described in an interesting article the brains of eminent men and women. Maurer, by reason of previous investigations, is especially well qualified for such researches. In a former letter I gave an account of his researches on the brain of Haeckel, which he described in the *Deutsche medizinische Wochenschrift*. Maurer emphasizes that the first point to which importance attaches in the appreciation of the brains of great geniuses is weight, and, for this reason, many data have been published on brain weights, and some surprise and disappointment has, at times, been felt over the results—quite unwarrantedly, it would seem. Centers that serve bodily functions, if they are strongly developed, may help to produce a heavy brain, though the intellectual centers may be poorly developed. On the other hand, alongside highly developed

intellectual centers there may be poorly developed centers for the bodily functions, which will explain why the brain of an eminent man may not have the weight that would naturally be expected. A heavy brain may be the result of hyperdevelopment of the neuroglia. Next after the weight, the most important consideration is the surface of the brain. It is a generally accepted hypothesis that in men of exceptional intelligence the surface of the hemispheres of the cerebrum has more numerous convolutions and deeper furrows between them than are found in ordinary brains. For intellectual work, these considerations are of importance: (1) the whole frontal lobe of the cerebrum; (2) the marginal and angular gyri of the parietal lobe; (3) to a certain extent, the upper portion of the temporal convolution, and (4) the precuneus on the inner surface of the cerebrum. According to recent investigations, the precuneus plays a part in the formation of space concepts.

Eminent men may be divided into two groups, which must be taken into consideration in the appreciation of their brains: (1) geniuses who, in addition to their special gifts, possess remarkable all-round ability, and (2) persons with quite one-sided gifts. In Group 2 may be classed famous musicians who, from their youth, have devoted themselves entirely to music; also many mathematicians belong to this group. The brains of these persons with one-sided gifts present, however, a special interest. The average weight of the brain in the male of the 30 to 40 age group is about 1,375 gm.; that of the female, of the same age group, is about 1,245 gm. Of the brains of eminent men of former times only the weight is known, and the data on even this point are not incontestable. The weight of Cromwell's brain is given as 2,233 gm., and that of Byron's brain as 1,807 gm., but Rudolf Wagner, one of the most versatile investigators on the brain, declares that these figures are too high; he likewise questions the reputed weight of the brain of Cuvier, which is given as 1,861 gm. Other reported brain weights are: Gauss, 1,492 gm. (age at death, 78); Liebig, 1,352 gm. (age 70); Bunsen, 1,295 gm. (age 88); Menzel, 1,298 gm. (age 89); Mommsen, 1,425 gm. (age 86); Helmholtz, 1,420 gm. (age 73). In recent decades, the brains of many eminent men have been examined. David von Hansemann examined the brains of Helmholtz, Mommsen, Menzel and Bunsen. Gustav Retzius examined the brains of a considerable number of distinguished Swedes of widely different callings; among others, that of the woman mathematician Sonja Kowalewska. In the brains of all the men mentioned, the convolutions of the frontal lobe were significantly well marked. But also certain other portions of the brain were well developed; for example, in the brain of Gauss the anterior portion of the lower frontal gyrus was highly developed, and in Helmholtz' brain, the precuneus. In the brain of Gambetta, the gyrus of Broca, the speech center in the inferior frontal gyrus, is said to have undergone a double development. In the brains of mathematicians, attention is called to the fact that the lateral portions of the frontal lobe show an especially marked furrowing. This was the case in the brains of Gylden and of Sonja Kowalewska (who, in other respects, had a typical female brain, with quite ordinary fissures). Researches on the brains of many famous musicians have been made, and according to the interesting study by Dr. Klose, who examined the brain of the eminent pianist Sokeland, who died at an early age, certain portions of the brain of musicians are highly developed; namely, the superior temporal gyrus, the inferior parietal lobule (the supramarginal gyrus) and the anterior and posterior central gyri. All these data seem to have little value when we learn that the brains of many men who have never become distinguished may present just as highly developed a structure as the brains of men who have been eminent. However, if the results of scientific researches are viewed rightly, their value will be understood and appreciated. "If one were to present to me the brain of an unknown person with the request that I state what the possessor accomplished in his lifetime, I would reject the inquiry as presumptuous. If, however, I take up the examination of the brain of a person whose career is familiar to me, I shall know to what regions of the brain, on the basis of previous experiences, I must pay particular attention, and I am sure not to be disappointed. I have gained this conviction from my study of the brains of Ernst Haeckel, Ernst Abbe and Ernst Stahl." Modern science has pointed out new avenues of approach that seem destined to prove significant for the examination of the brains of outstanding leaders. Through the researches of Brodman, we have learned that the finer structure of the cerebral cortex varies in the different regions of the cerebrum. For this reason, an estimation of the special significance of various portions of the brain, on the basis of anatomic facts, is quite possible. Brodman has prepared a brain chart, on which are designated many different characteristic divisions, some of which are sharply differentiated and some of which overlap each other, to a certain extent. Unfortunately, these new criteria cannot be applied to the brains that have been examined in the past; but, in the future, these microscopic researches are sure to acquire great significance along with the microscopic findings.

Personal

Professor Salkowski, for many years director of the chemical laboratory of the Pathologic Institute in Berlin, died, March 10, at the age of 78. His service in the institute extends back to the time when Virchow was the director. The numerous valuable researches of Salkowski were mainly in the fields of physiologic and pathologic chemistry, but they deal also, in part, with pharmacology and hygiene. We are indebted to him especially for excellent treatises on the effects of putrefying proteins. One of his first articles was on leukemia. His treatises on the formation of sugar in yeast are also noteworthy. He has written also on autodigestion of organs and the quantitative distribution of oxidative ferment in the organs, the demonstration of peptone in the urine, the estimation of oxalic acid in the urine; peptotoxin, casein, etc. He discovered also the pentoses in the urine. Through his findings of phylosterin in vegetable fats, Salkowski established a new method for the discovery of the frequent adulteration of animal fats with vegetable fats. Two of his compendiums have had a wide sale: "Die Lehre vom Harn" (urology) and "Parktikum der physiologischen und pathologischen Chemie."

Geheimer Medizinal-Rat Scheube died recently in Greiz at the age of 71. He served for a long period as medical commissioner in the principality of Reuss. From 1877 to 1881 he was professor in the Kyoto (Japan) Medical College. He was privatdozent for internal medicine in Leipzig from 1883 to 1885. He was thoroughly familiar with tropical diseases by reason of his travels in the tropical countries of Asia. He was the author of the work, "Die Krankheiten der warmen Länder," which has passed through several editions.

Marriages

WILLIAM HARVEY WHITMORE, lieutenant, M. C., U. S. Navy, Lynchburg, Va., to Miss Harriet Weiss Angeny of Philadelphia, April 5, at Pensacola, Fla.

LAUREN HOLMES GOLDSMITH, Atlanta, Ga., to Miss Margaret Mason Rowe of Athens, April 9.

ROY DECK to Miss Mabel Rice, both of Lancaster, Pa., February 6, at Oak Lane.

Deaths

Justin Edwards Emerson ✠ Newark, N. Y.; Medical School of Harvard University, Boston, 1868; formerly clinical professor of neurology at the Detroit College of Medicine, Detroit; member of the Michigan State Medical Society; the Detroit Society of Neurology and Psychiatry, the American Medico-Psychological Association and the American Psychiatric Association; fellow and past president of the American Academy of Medicine; at one time assistant physician to the Michigan Insane Asylum, Kalamazoo, consulting neurologist to the Children's Free and Harper hospitals, Detroit, and attending physician to St. Joseph's Retreat, Dearborn, Mich.; aged 82; died, April 8, at Clifton Springs.

Thomas Warloe, Chicago; Rush Medical College, Chicago, 1891; member of the Illinois State Medical Society; attending obstetrician to the Norwegian-American Hospital, attending physician to the Norwegian Lutheran-Bethesda Home and consulting physician to the Norwegian Old People's Home; aged 56; died, April 18, of heart disease.

Thomas Milton Fleming, Mount Pleasant, Texas; Medical Department of the Tulane University of Louisiana, New Orleans, 1891; member of the State Medical Association of Texas; past president of the Titus County Medical Society; president of the State National Bank; aged 55; died, April 4, of cerebral hemorrhage.

William Winston Snead, Grays Knob, Ky.; University of Virginia Department of Medicine, Charlottesville, 1906; member of the Kentucky State Medical Association; aged 44; died, March 21, at the Norton Infirmary, Louisville, of pneumonia, following an operation on the gallbladder.

Hubert Perry Butts, Los Angeles; Medical Department University of Louisville, Louisville, Ky., 1895; formerly a practitioner in Indiana and Kentucky; served in the M. C., U. S. Army, during the World War, with the rank of captain; aged 49; died, April 8, of cerebral hemorrhage.

Erving Melville Howard, Camden, N. J.; Hahnemann Medical College of Philadelphia, 1877; emeritus professor of materia medica at his alma mater; founder, and formerly on the staff, of the West Jersey Homeopathic Hospital; aged 75; died, April 13, following a long illness.

Harry Gilbert Fleming ✠ Anderson, Ind.; Medical College of Indiana, Indianapolis, 1905; served in the M. C., U. S. Army, during the World War, with the rank of captain; aged 44; died, April 6, of a fractured skull, the result of an automobile accident.

Emil Charles Luks, New York; Philadelphia University of Medicine and Surgery, Philadelphia, 1868; University of Vermont College of Medicine, Burlington, 1885; also a druggist; formerly coroner of Schuylkill (Pa.) County; aged 91; died, April 4, of senility.

Augustus Koenig, Philadelphia; University of Pennsylvania School of Medicine, Philadelphia, 1894; member of the Medical Society of the State of Pennsylvania; formerly lecturer and instructor at his alma mater; aged 52; died, April 4.

John Franklin Uren, Toronto, Ont., Canada; Trinity Medical College, Toronto, 1890; Victoria University Medical Department, Toronto, 1890; on the staff of St. Michael's Hospital; aged 60; died, March 1, of influenza.

Dwight Satterlee, Los Angeles; Berkshire Medical College, Pittsfield, Mass., 1862; also a druggist; Civil War veteran; formerly division surgeon for the Chicago and Northwestern Railroad; aged 86; died, March 21, of senility.

Robert Wilson Forrest, Toronto, Ont., Canada; University of Nashville Medical Department, Nashville, Tenn., 1865; University of Toronto Faculty of Medicine, Toronto, 1872; aged 83; died, February 23, of senility.

James P. Way ✠ Chicago; College of Physicians and Surgeons, Chicago, 1887; surgeon to the Chicago and Eastern Illinois, and the Baltimore and Ohio railroads; aged 60; died, April 21, of myocarditis.

Clifford Nathan Thomas Barnett, Deatsville, Ala.; Medical Department of the University of Alabama, Tuscaloosa, 1905; member of the Medical Association of the State of Alabama; aged 46; died, April 2.

Alexander Blake Ford, Oshawa, Ont., Canada; Queen's University Faculty of Medicine, Kingston, Ont., 1897; aged 52; died, March 2, at the Toronto General Hospital, Toronto, of septicemia.

Albert S. Bower, Los Angeles; Jefferson Medical College of Philadelphia, 1882; formerly a practitioner in Salt Lake City; aged 67; died, March 31, of acute nephritis and septicemia.

Joseph B. MacNaughton, Waupaca, Wis.; University of Glasgow, Scotland, 1883; also a druggist; formerly health officer and city physician; aged 66; died, April 3, of pneumonia.

Mann W. McGown, Hemphill, Texas; Gate City Medical College, Texarkana, 1904; member of the State Medical Association of Texas; aged 45; was shot and killed, April 6.

Benjamin J. McConnell, Winnipeg, Manit., Canada; Queen's University Faculty of Medicine, Kingston, Ont., 1881; provincial coroner for Manitoba; aged 61; died, February 14.

Tillman E. McMurtry, Chicago; Rush Medical College, Chicago, 1899; member of the Illinois State Medical Society; aged 55; died, April 22, of tuberculosis of the kidney.

James Robert Black, Marked Tree, Ark.; Memphis Hospital Medical College, Memphis, Tenn., 1893; also a druggist; aged 64; died suddenly, March 30, of heart disease.

Daniel Henry Jenkins, Scranton, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1893; aged 60; died, March 8, of acute dilatation of the heart.

Charles Lovett Randall, Dansville, Mich.; Long Island College Hospital, Brooklyn, 1864; Civil War veteran; aged 82; died, March 29, of cerebral hemorrhage.

Calvin Suverill Case, Kenilworth, Ill.; University of Michigan Medical School, Ann Arbor, 1884; also a dentist; aged 76; died, April 16, following an operation.

Stanton Emmett Deeley, Mount Vernon, Ohio; Cleveland University of Medicine and Surgery, Cleveland, 1896; aged 49; died, February 21, of heart disease.

Jacob Margulis, New York; Columbia University College of Physicians and Surgeons, New York, 1900; aged 49; died, February 25, of edema of the lungs.

William T. Greenwood, St. Catharines, Ont., Canada, McGill University Faculty of Medicine, Montreal, Que., 1904; aged 41; died, February 25.

Granville M. Walker, Chicago (licensed, Illinois, 1878); Civil War veteran; aged 85; died, April 9, of skull fracture, when he fell from a window.

George N. Hutcheson, Arlington, Texas; Cincinnati College of Medicine and Surgery, 1874; aged 76; died, March 31, following a long illness.

Birckner H. Pasley, Decatur, Ill.; Starling Medical College, Columbus, Ohio, 1865; Civil War veteran; aged 84; died, April 4, of senility.

Joseph L. Dorris, Banklick, Ill.; St. Louis College of Physicians and Surgeons, St. Louis, 1894; aged 65; died, April 8, of diabetes mellitus.

Alexander Smith Truman, Chicago; University of Michigan Medical School, Ann Arbor, 1872; aged 80; died, April 6, of chronic nephritis.

Charles Walden Thompson, Clinton, Ont., Canada; University of Toronto Faculty of Medicine, Toronto, 1893; aged 58; died, February 18.

Richard J. Wilson, Salem, Ind.; Miami Medical College, Cincinnati, 1874; president of the Citizens' State Bank; aged 76; died, April 10.

Marcus U. Nix, Atlanta, Ga.; University of Georgia Medical Department, August, 1892; aged 66; died, February 1, of heart disease.

Mandren M. Bailey ✠ Loveland, Colo.; Denver College of Medicine, Denver, 1884; aged 68; died, March 10, of pneumonia.

Carl Layfield Oatman, Collinsville, Ill.; Barnes Medical College, St. Louis, 1896; aged 45; died, April 3, of chronic nephritis.

Charles Austin Allen, Clayton, Ind. (licensed, years of practice); Civil War veteran; aged 81; died in April, of senility.

Charles Chittick ✠ Frankfort, Ind.; Medical College of Ohio, Cincinnati, 1876; aged 74; died, April 7, of heart disease.

David R. Summy, Columbus, Ohio; Jefferson Medical College of Philadelphia, 1883; aged 69; died, February 18.

William T. George, Mantee, Miss. (licensed, Mississippi, 1889); aged 62; died in March, of heart disease.

Joseph Amsel, Milwaukee; University of Warsaw, Poland, 1867; aged 76; died suddenly, March 29.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE JOURNAL'S BUREAU OF INVESTIGATION, OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER GENERAL MATERIAL OF AN INFORMATIVE NATURE

HERRADORA SPECIALTIES NOT ACCEPTED FOR N. N. R.

Report of the Council on Pharmacy and Chemistry

The Council has authorized publication of the following report.

W. A. PUCKNER, Secretary.

Early in 1922 the Scientific Chemical Co., New York (Marcus Aurelio Herradora, M.D., President) requested the Council to consider its intravenous preparations. The firm sent the proof of a proposed booklet which contained extravagant claims for intravenous therapy in general and for the Herradora specialties in particular, and also a typewritten manuscript, "Digitalis Compound (Herradora) for Intravenous Use," with a request that anything therein which conflicted with the rules of the Council be brought to its attention. The firm also sent specimens of the following preparations:

Herradora's Arsenic Compound for Intravenous Use, Nos. 1 to 6.
Herradora's Arsenic and Hypophosphites for Intravenous Use.
Herradora's Arsenic and Iron Compound for Intravenous Use.
Herradora's Calcium Compound for Intravenous Use.
Herradora's Calcium-Sodium-Glycerophosphate Compound for Intravenous Use.
Herradora's Chlorids Compound for Intravenous Use.
Herradora's Chlorids with Iron Compound for Intravenous Use.
Herradora's Creosote Compound for Intravenous Use, Nos. 1 and 2.
Herradora's Digitalin Compound.
Herradora's Glycerophosphate-Iron and Nickel Compound for Intravenous Use.
Herradora's Guaiacol Compound for Intravenous Use.
Herradora's Iodids Compounds for Intravenous Use.
Herradora's Hexamethylenamine and Guaiacol Compound for Intravenous Use.
Herradora's Iron, Manganese and Nickel Compound for Intravenous Use.
Herradora's Mercury Compound for Intravenous Use.
Herradora's Quinine Compound for Intravenous Use, Nos. 1 and 2.
Herradora's Sodium Iodid for Intravenous Use.
Herradora's Sodium Iodid-Salicylate-Guaiacol Compound for Intravenous Use.

These, in addition to the names of the preparations and the "formulas," bore—with a few exceptions—the following ambiguous and questionable statement:

"Special aseptic, sterilized and antiseptic bland mutual dissolvent to make 20 Cc. Drugs herein contained have been modified perfecting their purity to regulate toxicity, thus insuring safe and higher efficiency."

The proposed advertising was apparently written by one whose knowledge of therapeutics was a mixture of the latest enthusiasm for intravenous therapy and the most archaic pharmacologic tenets. Its style was bombastic and pseudoscientific. The material abounded in unwarranted and unsubstantiated statements in favor of intravenous administration of drugs and for the use of complex mixtures of drugs. The preparations bore, in many cases, a striking resemblance to "intravenous" preparations which had been previously reported on unfavorably. In view of this fact and the firm's statement that it desired to remove any claims objectionable to the Council, the objections to the advertising were pointed out in a general way, and the firm was supplied with reports of the Council dealing with similar preparations.[1] Since some of the products contained hypophosphites and glycerophosphates,[2] Council reports which set forth the lack of evidence for the therapeutic use of these were also sent.

In September, the firm sent a revision of parts of the booklet and of the whole manuscript on "Digitalis Compound (Herradora) for Intravenous Use." This revision was not satisfactory. As before, this advertising made claims for intravenous medication that are fundamentally opposed to modern therapeutic teachings. The tenor of the entire matter was to discredit the oral administration of drugs and to substitute intravenous medication as a routine. The fundamental objections to it with specific illustrations of unwarranted statements were a second time brought to the attention of the firm. Since then the firm has not supplied the Council with any evidence to indicate that a genuine effort is being made to remove the objections.

On the other hand, the Council learned that the firm was making efforts to secure the use of its preparations by physicians and in hospitals. On December 20, 1922, a physician received advertising from the firm which was almost a verbatim copy of parts of the booklet originally submitted. This advertising is evidently a reprint with minor changes which do not alter the original meaning.

SOME RECENT CLAIMS

The following, quoted from the present advertising circular "Syphilis, Its Treatment" illustrates the character of the claims advanced for the Herradora specialties:

"The arsenic compound presented here has been completely dimethylized, readily diffusible, while its organic structure is still retained. As such it may be described as a harmonized chemical medium between the plain cacodylate and dioxi-diamino type of arsenicals. It is prepared in six ascending strengths which will be hereafter described. It has been prepared for the treatment of syphilis or any other *trypanosome disease* where the maximum dose of arsenic is required. These arsenic compounds which I have prepared are regarded as superior to any other form of organic arsenic for the treatment of syphilis now in use."

According to the label on the specimens sent to the Council, Herradora's Arsenic Compound for Intravenous Use, No. 1 contains: "Arsenic-Organic Compound, Equivalent to Sodium Dimethylarsenate (As 1½ grains) 5 grains; Mercuric Iodid, 1/18 grain; Arsenic Iodid, 1/8 grain." The other forms, Nos. 2 to 6 inclusive, are claimed to contain the same amounts of mercuric iodid and of arsenic iodid but progressively increasing amounts of the "arsenic-organic compound; equivalent to sodium dimethylarsenate," the arsenic element of which, according to the formulas, varies from 30 per cent. to 34.84 per cent. So far as the statements go, the character and the composition of the "arsenic-organic compound" are not declared and the preparations may be regarded as secret in composition. The language of the advertising, however (particularly the claimed freedom from untoward effects), the amount of drug in a dose, and the chemical behavior of the solutions strongly suggest that in Herradora's Arsenic Compounds we have another sodium cacodylate preparation patterned after Venarsen,[3] on which the Council reported in 1915 and which has been a pattern[4] for similar products put out by firms specializing in intravenous therapy.

If the "arsenic-organic compound" in Herradora's Arsenic Compound *is* sodium cacodylate (sodium dimethylarsenate), then the claims for its efficacy are unacceptable, for sodium cacodylate has been found without effect on experimental trypanosomiasis and inefficient in the treatment of syphilis.[5] If the "arsenic-organic compound" *is not* sodium cacodylate then the claims are unacceptable because they are made for a compound of secret composition for which there is no evidence of therapeutic worth other than the assertions of the manufacturer. In any case, it is irrational to administer an organic arsenic compound in combination with mercuric iodid and an inorganic arsenic compound. It should be mentioned in passing, that while the preparation is claimed to contain arsenic iodid, this compound (AsI_5) does not exist, and arsenous iodid (AsI_3) is decomposed in aqueous solution into arsenous acid and hence arsenic iodid is probably not contained in the solution.

1. Venarsen, Report Council Pharm. & Chem., J. A. M. A. **64**: 1780 (May 22) 1915; Venosal, Report Council Pharm. & Chem., J. A. M. A. **70**: 48 (Jan. 5) 1918; Some of Loeser's Intravenous Solutions, Report Council Pharm. & Chem., J. A. M. A. **76**: 1120 (April 16) 1921.

2. The Therapeutic Value of Glycerophosphates, Report Council Pharm. & Chem., J. A. M. A. **67**: 1033 (Sept. 30) 1916; The Hypophosphite Fallacy, Report Council Pharm. & Chem., J. A. M. A. **67**: 760 (Sept. 2) 1916.

3. Venarsen, Report Council Pharm. & Chem., J. A. M. A. **64**: 1780 (May 22) 1915.

4. "Arsenoven S. S." and "Arseno-Meth-Hyd," Report Council Pharm. & Chem., J. A. M. A., **73**: 353 (Aug. 2) 1919.

5. Cole, H. N.: A Study of Sodium Cacodylate in the Treatment of Syphilis, J. A. M. A. **67**: 2012 (Dec. 30) 1916; Sodium Cacodylate in the Treatment of Syphilis, Correspondence, J. A. M. A. **68**: 390 (Feb. 3) 1917; Sodium Cacodylate in the Treatment of Syphilis, Correspondence, J. A. M. A. **68**: 566 (Feb. 17) 1917; Pharmacology of Arsenicals, Current Comment, J. A. M. A. **76**: 595 (Feb. 26) 1921; Mon-Arsone Not Admitted to N. N. R., Report Council Pharm. & Chem., J. A. M. A. **76**: 1781 (June 18) 1921.

INADMISSIBLE TO N. N. R.

The Herradora Intravenous Specialties of the Scientific Chemical Co. are inadmissible to New and Nonofficial Remedies for the following reasons:

1. The therapeutic claims advanced for them are unwarranted and exaggerated, and there is no evidence to warrant the intravenous administration of them.

2. With one exception ("Herradora's Sodium Iodid for Intravenous Use") the preparations are mixtures of drugs, the administration of which is not in the interest of sound therapy, particularly when these preparations are intended for intravenous use.

3. Herradora's Sodium Iodid for Intravenous Use is marketed with unwarranted therapeutic claims, such as:

"As prepared sterile by me, the sodium iodid molecule has been subjected to a process which renders it easier for the iodin atom to free itself in the tissues much more rapidly than in ordinary sodium iodid."

In reporting on Venodine,[6] a sodium iodid preparation, the Council held that, since iodids are easily absorbed from the mucous membrane of the gastro-intestinal tract and are usually well tolerated by the stomach, there is no reason for resorting to intravenous administration. This view the Council subsequently reiterated.[7]

4. With the exception of Herradora's Sodium Iodid, Calcium Compound, and Iodids Compound, all of the Herradora specialties are claimed to contain ingredients, the identity and the uniformity of which are not insured by their inclusion in the U. S. Pharmacopeia, National Formulary, or by their admission to New and Nonofficial Remedies. Were the Herradora preparations which contain such unstandardized constituents acceptable otherwise, it would be necessary that these constituents be examined as to their composition, as to the methods employed to insure their identity and uniformity and to determine that these constituents were of therapeutic worth. The following are the unacceptable constituents which are contained in one or more of the Herradora mixtures: "Arsenic-Organic Compound" (if the Scientific Chemical Co. admitted that this is sodium cacodylate, then the firm would be required to substantiate the highly improbable claims of superiority), Ferric Dimethylarsenate,[8] "Arsenic-Mercuric-Organic Compound," Lithium Chlorid, "Guaiacol-Glyceryl Ester," "Digitalin" (the term is without meaning unless it is specified whether "German," "French" or "True" is used), Convallamarin,[9] Adonidin, Nickel Bromid, Lithium Benzoate, Manganese Citrate, Manganese Glycerophosphate, Sodium Lactate and "Mercuric-Organic Compound."

The facts presented in the preceding report were sent the Scientific Chemical Co. In reply the company assured the Council that its "literature and compounds" were being changed "to conform to Handbook of Therapy American Medical Association" and requested further postponement of the consideration of its products.

FUNDAMENTALLY IRRATIONAL

The preparations of the Scientific Chemical Co. are fundamentally irrational and by no effort could they be made eligible for admission to New and Nonofficial Remedies. The Council, however, wished to give the company every opportunity to bring the preparations into conformity so far as possible with the rules that govern the Council in the consideration of articles, and for this reason the Council has postponed definite action for nearly a year.

Advertising matter mailed to a physician in February, 1923, illustrates the methods followed by the Scientific Chemical Co. in the exploitation of its preparations. One of these circulars, entitled "Influenza and Pneumonia, Its Treatment" begins with a number of trite sayings, thus predisposing the reader to agree with its author. Then follows a rather bold statement that the author is not in accord with the manner in which the diseases are often treated and he proceeds to give details of the treatment of influenza and of pneumonia. The discussion contains much that is misleading if not definitely false. Thus the author speaks of coal-tar antipyretics being more or less hemolytic. It is true that they are capable of producing hemolysis when used in excessive doses but they are not dangerous when used properly.

It would be profitless to follow the maze of polypharmacy expounded in this circular through all of its ramifications. It suffices to illustrate the absurdity of the advice offered by stating that its author recommends a succession of twelve substances or mixtures containing a total of thirty-nine drugs in the treatment of influenza! A like number (including repetitions) are recommended for the treatment of pneumonia. Some of the preparations recommended contain no less than six different drugs, the combined action of which no human being can possibly foresee.

Not only does the circular recommend an extraordinary number of substances to be administered intravenously in these conditions, but it recommends many that, though once popular, have been shown to be devoid of any therapeutic value in the treatment of any disease. An example of this is found in the recommendation of hypophosphites as represented by "Arsenic-Hypophosphite Compound."

Another circular is entitled "The Treatment of Arteriosclerosis and High Blood Pressure" with the subtitle "Arteriosclerotic Serum (Herradora) for Intramuscular Use." This begins with a discussion of the cause of arteriosclerosis followed by the recommendation that the condition be treated by the usual measures including restricted diet, by purgation and then with the "Herradora Serum." The latter is sometimes referred to as a solution and sometimes as a serum. It is admitted to be nothing more than a solution of the iodid, sulphate, phosphate and carbonate of sodium.

A perusal of the "literature" issued by the Scientific Chemical Co. leads to the belief that the firm is much more interested in persuading the unthinking to use its specialties than it is in scientific therapy. It is an affront to rational therapy to have these mixtures which are reminiscent of the old days of polypharmacy exploited in the treatment of such serious diseases as pneumonia and influenza. Medicine continues to have its disappointments with whatever therapeutic measures are followed in the treatment of pneumonia, which is one of the most baffling of diseases, but there is no possibility of progress while following such crude and unscientific measures as those advocated by the Scientific Chemical Company.

The Council is convinced that the propaganda contained in the advertising matter issued by the Scientific Chemical Co is detrimental to the rational practice of medicine and the public welfare. Therefore it has authorized publication of this report.

6. Articles Refused Recognition (Venodine; Standard Radium Solution for Intravenous Use), Report Council Pharm. & Chem., J. A. M. A., 64: 2155 (June 26) 1915.

7. Some of Loeser's Intravenous Solutions, Report Council Pharm. & Chem., J. A. M. A. 76: 1120 (April 16) 1921.

8. Ferric Cacodylate Omitted from from New and Nonofficial Remedies, 1920, p. 62.

9. Marvin, H. N., and White, Paul D.: Clinical Studies of Drugs of the "Digitalis Series," J. A. M. A. 77: 1865 (Dec. 10) 1921.

Correspondence

"ORIENTAL SORE (CUTANEOUS LEISHMANIASIS) IN THE UNITED STATES"

To the Editor:—The illustrations in Dr. Lambert's paper on Oriental Sore (THE JOURNAL, April 7, p. 986) show very well the location of the lesions on the back of the elbow and ankle in certain types of the sore. Curiously, these are the favorite sites of the bites of *Stegomyia fasciatus* (*Aedes argenteus*), and it is not unlikely that *Stegomyia* may under certain circumstances impart this infection when infected with a flagellate of this class (*Herpetomonas*). The diagnosis of dermal leishmaniasis in America is usually confined to communities in which laboratories for diagnosis are available and routine examinations with the microscope practiced. No doubt this infection will be encountered in the warmer southern tier of states when it is thoroughly searched for.

The nature of the lesion—its specific character—has been overlooked because of its polymorphous appearance. Aleppo button is perhaps the classical type, but lesions spreading

like lupus, or exfoliative in appearance, are seen. Small ulcerating papules are less common than the large, solitary, circular ulcer. Lesions like yaws and ringworm are seen in the South American forms. Smears from all doubtful skin lesions, and when involving the nose, of the nasal septum as well, should be stained with a polychrome blue and eosin stain (Hastings, Wright or Leishman). Parasites are very sparse and often degenerated in the granulomatous area in the floor of the ulcer. The margin of the ulcer usually contains more endothelial cells invaded with the protozoon.

It should not be forgotten that the type of the disease common in South America and that likely to be encountered in Americans and others returning from the interior of Brazil is not self-limited, but recurs in the form of a serious and sometimes fatal ulceration of the nasopharynx and larynx which may appear years after the occurrence of the primary ulcer or lesions on the skin.

SAMUEL T. DARLING, M.D., Leesburg, Ga.

"CAUTION IN USE OF MERCUROCHROME-220 SOLUBLE"

To the Editor:—The communication of Dr. Stolz (THE JOURNAL, April 7) seems to call for comment. The salts of organic bases generally exhibit an acid reaction in solution because of a greater or less degree of hydrolysis. It might, therefore, be expected that those salts, when brought into contact with the sodium salt of a comparatively weak organic acid, such as the soluble form of mercurochrome, would act like any other acid and precipitate the dye. I mixed equal volumes of 5 per cent. procain (a hydrochlorid of an organic base) and 2 per cent. mercurochrome-220 soluble. A red precipitate, which soon became gummy, was formed at once, and practically all the dye was thrown out of solution, as indicated by the faint color of the supernatant liquid. Precipitation of mercurochrome was also brought about by cocain hydrochlorid and codein sulphate. As it was thought possible that mercurochrome might be acting as an alkaloid precipitant, another experiment was made with a saturated solution of codein base, this being chosen because it is fairly soluble in water. In this case there was no reaction with 2 per cent. mercurochrome solution, thus showing the essential part played by the acid part of the alkaloid salt.

Dr. Stolz's note of caution is, indeed, timely, and will doubtless be the means of preventing repetitions of his unpleasant experience by other physicians. However, the case described should place emphasis on the incompatibility of mercurochrome solutions with solutions of alkaloid salts, such as those of procain and cocain, and it should be clearly borne in mind that the precipitation of mercurochrome is *not* a thing that may occur fortuitously, but may with certainty be avoided by refraining from using simultaneously drugs of an acid character. Boric acid is an exception; it is so feebly acid that a saturated solution does not precipitate mercurochrome.

Silver nitrate and zinc sulphate, both of which are used in the genito-urinary tract, produce precipitate with mercurochrome. They may be alternated with the dye, but should not be used concurrently with it. In general, salts of heavy metals will precipitate mercurochrome.

It is suggested that when it is desired to use a local anesthetic with mercurochrome-220 soluble, a 2 per cent. solution of benzyl alcohol be employed. This has been found to be compatible with the dye.

EDWIN C. WHITE, PH.D., Baltimore.

[The incompatibility of mercurochrome—220 soluble with local anesthetics was the subject of a report from the A. M. A. Chemical Laboratory in THE JOURNAL, April 14, 1923, p. 1091.]

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

BILIRUBIN ESTIMATION TEST

To the Editor:—Please give the details of the bilirubin colorimetric estimation test of Meulengracht, referred to in the *Archives of Dermatology and Syphilology*, April, 1923, p. 496.

G. H. J. PEARSON, M.D., Ottawa, Canada.

ANSWER.—From a brachial vein, about 3 c.c. of blood is collected in a small test tube, into which have been placed 2 drops of a 3 per cent. sodium oxalate solution to prevent coagulation. The test tube is shaken gently a few times and let stand for twenty-four hours. If the estimation is desired at once, the centrifuge may be used. After standing, 0.5 c.c. of the plasma is transferred with a pipet to a test tube graduated to 0.5 c.c., and the transferred plasma is diluted with physiologic sodium chlorid solution until its color is identical to that of the standard solution. The height of the diluted plasma, as shown on the graduated test tube, gives the bilirubin index. If the index is greater than 15, as is true in deep jaundice, the plasma must first be diluted and the index then found, multiplied by the degree of dilution. The standard solution is made of 0.05 part of potassium bichromate, 500 parts of distilled water, and 2 drops of sulphuric acid. It has the color of a pure bilirubin solution, and is stable.

It is most important in performing this test that no hemolysis occur. Venous blood, therefore, not capillary, must be used. Meulengracht procures blood by means of the curved cannula of L. Nielson. Any substance that causes hemolysis, e. g., water, ether, alcohol or acid, must be entirely removed from the glassware used. The test tube for the standard solution and that for the plasma must be of the same quality of uncolored glass.

The strength of the standard solution is arbitrary. The standard solution is clear, while the plasma is opalescent, owing to blood platelets and fat. Although a slight opalescence is no hindrance to the test, it is best to collect the specimen of blood while the patient is fasting or before meals to avoid much fat.

In normal persons, the bilirubin index ranges from 1 to 5. Any index above 5 indicates a pathologic condition: from 5 to 10, a low grade jaundice not noticeable in the skin; from 30 to 50, a medium jaundice, and from 50 to 100, a marked jaundice.

This test is practical in doubtful cases of gallstones, and in hemolytic anemias. It is also useful to determine whether jaundice is growing lighter or deeper.

LETHAL DOSE OF PHENOBARBITAL (LUMINAL)

To the Editor:—What do you consider to be a lethal dose of luminal, the symptoms of poisoning, and treatment. A woman aged 60, took with suicidal intent about fifteen 1½ grain luminal tablets. When I saw her, about six hours later, I was unable to arouse her; the pulse was 114, the respiration 22 and the temperature 98.6; the reflexes were absent except for pain; there was no cyanosis. I saw her again twenty-four hours after she had taken the tablets; she was still comatose, but at times voluntarily moved both arms and both legs. The temperature was 98.6; pulse, 114, and respiration, 26; there was no cyanosis. The patient was gradually becoming unable to swallow even water. When I was called again thirty-six hours after the tablets were taken, she was cyanotic; the temperature was 99.6; pulse, 124, and respiration 30 and shallow; the lungs were full of coarse, mucous râles; the reflexes were absent even for pain stimulus. The patient never regained consciousness, and died about forty hours after taking the tablets. No necropsy was performed. For about four years she had been sick with headaches and general pain. The systolic blood pressure was 200; diastolic, 140. The urine was negative for albumin and casts. The patient had been blind since 13 years of age, so the pupils showed nothing.

C. L. WHITE, M.D., Pittsburg, Kan.

ANSWER.—The lethal dose of phenobarbital (luminal) in man is not known. In animals, the toxic and fatal doses are close together (New and Nonofficial Remedies, 1923, page 62). An article on phenobarbital poisoning by John Phillips appeared in THE JOURNAL, April 22, 1922, page 1199, wherein the symptoms were reported and the literature reviewed. The treatment of phenobarbital poisoning is essentially the same as that for chloral.

Medical Education, Registration and Hospital Service

COMING EXAMINATIONS

ARKANSAS: Little Rock, May 8-9. Sec., Dr. J. W. Walker, Fayetteville.

FLORIDA: Daytona Beach, June 11-12. Sec., Dr. W. M. Rowlett, Tampa.

GEORGIA: Atlanta, June 6-8. Sec., Dr. C. T. Nolan, Marietta.

IOWA: Iowa City, May 31-June 2. Sec., Dr. Rodney P. Fagen, Capitol Bldg., Des Moines.

KENTUCKY: Louisville, June 12. Sec., Dr. A. T. McCormack, State Board of Health Bldg., Louisville.

MASSACHUSETTS: Boston, May 8-10. Sec., Dr. Charles E. Prior, State House, Boston.

MICHIGAN: Ann Arbor, June 12. Sec., Dr. Beverly D. Harison, 601 Stroh Bldg., Detroit.

MINNESOTA: Minneapolis, June 5-7. Sec., Dr. Thomas McDavitt, Lowry Bldg., St. Paul.

NATIONAL BOARD OF MEDICAL EXAMINERS: Written examinations in Class A medical schools. Parts I and II, June 25-27, and June 28-29. Parts I and II, September 24-26, and September 27-28. Secretary, Dr. John S. Rodman, 1310 Medical Arts Bldg., Philadelphia. Application for these examinations must be made on or before May 15.

NEBRASKA: Lincoln, June 6-8. Sec., Mr. H. H. Antles, State House, Lincoln.

NEVADA: Carson City, May 7. Sec., Dr. S. L. Lee, Carson City.

OHIO: Columbus, June 5-8. Sec., Dr. H. M. Platter, Hartman Hotel Bldg., Columbus.

SOME NEEDED REVISIONS IN MEDICAL LICENSURE IN ACCORDANCE WITH PRESENT DAY MEDICAL EDUCATION*

KENDRIC C. BABCOCK, PH.D.
Provost, University of Illinois
URBANA, ILL.

A layman's study of the abstracts of laws and state board rulings regulating the practice of medicine in the United States, as revised to March, 1922, leads straight to the conclusion that most of these laws and regulations have failed to take into account in any really adequate fashion the great changes in the scope and organization of schools of medicine of the present time. Iowa, for example, is operating under a practice act of 1886, amended last in 1909; Texas follows the schedule of the act of 1907; the requirements of the boards in California and Michigan bear evidence of having been formulated in the pre-Carnegie, or paleozoic, period of medical education. Certain other states, such as Massachusetts, Maine, Missouri, Nebraska and Idaho, have taken large cognizance of changed conditions, and have modified their regulations accordingly.

In the earlier period just mentioned, no real standardization of medical schools or medical education in this country had been attempted. Men sitting in this hall today will recall the amazement and alarm which they experienced as they considered the results of the first general investigations of medical education about 1906. Under the conditions existing up to that time, licensing bodies had no alternative to writing very detailed and exacting prescriptions for their would-be brethren who desired to come up for examination for admission to the profession of medicine. Between the Harvard Medical School and the office of Dr. Buchanan was a wide and varied stretch of country out of which almost any sort of man might emerge and ask for a license. Small wonder or regret that the boards, representing the better sentiment of the profession, elaborated specifications as to education, time to be spent, and subjects to be covered. Even with these specifications it was hard to sift out the grains of wheat from the chaff which the cheap, private, money-making medical schools thrust into the market place. But

> The old order changeth, yielding place to new,
> And God fulfils Himself in many ways
> Lest one good custom should corrupt the world.

* Read before the Annual Congress on Medical Licensure, Public Health and Hospitals, Chicago, March 5, 1923.

PROGRESS OF MEDICAL EDUCATION

The progress of medical education during the last fifteen years is the most outstanding single feature in the history of professional education in the United States. The raising of standards of admission to medical colleges to a well-enforced requirement of two years of sound college work including certain prescribed sciences has been definitely accomplished, and the organization and administration of the medical colleges and of the institutions offering premedical training have made adjustment to the new requirements without serious complaint. Within the medical colleges themselves the reorganization of methods of instruction, the elaboration of the curriculum, the introduction of full-time specially trained instructors for at least half of the curriculum, and the cooperative enforcement of sound standards through the Council on Medical Education and Hospitals of the American Medical Association have given the Class A medical schools a recognized status and an efficiency quite undreamed of at the beginning of the investigations which resulted in the great report on medical education published by the Carnegie Foundation for the Advancement of Teaching in 1910.

FAILURE OF MACHINERY OF LICENSURE TO KEEP PACE

With this progress in medical education, the machinery of licensure seems to a layman hardly to have kept pace. The scheme of prescribed state examinations for all applicants for licensure, except as modified by principles of reciprocity with other states, the National Board of Medical Examiners or similar bodies, is in full operation and is likely to continue. Quite possibly, some further elevation of the plane of these examinations may be achieved by cooperative measures, through the National Board, some regional boards, or some further evolution of the organization of the Council on Medical Education and Hospitals. The figures for the examinations of the National Board give vitality to this possibility. For the last year the number of those taking the National Board's examinations was 194 for Parts I and II and 870 candidates are registered for examination.

Recent sorry and disheartening experiences in Illinois, in which is one of the great productive centers of medical education, might well dictate a general review of the present system of prescribed examinations and licensure. But this is not the time or place to undertake such a review. The drifting, unsuccessful practitioner of uncertain antecedents, the man trained in schools outside the United States, the man who belongs to a new medical cult but who is willing to yield a minimum of understanding of medical science for the sake of a license—these may well be put through severe and exacting examinations, whatever happens to the men trained under conditions such as now exist in Johns Hopkins, Cornell, Rush, or Stanford.

HAMPERING RESTRICTIONS

The restrictions and detailed specifications fixed by many of the state boards at the present time for admission to the examination and to licensure unquestionably operate to hamper quite unnecessarily both applicants and medical schools. Regulations which were good in the era of expansive and irresponsible medical education may become positively harmful in a succeeding generation when medical education, "lock, stock and barrel," is built on a different plan and shaped up under a different sense of responsibility. The words of the Texas statute of 1907, "Such schools shall be considered reputable within the meaning of this act whose entrance requirements and course of instruction are as high as those adopted by the better class of medical schools of the United States," may be set over against the simple summary of the requirements of the Nebraska board: "The board recognizes only those medical colleges which are rated in Classes A

and B by the Council on Medical Education of the American Medical Association," and the similar statement for the state of Montana, "No applicant who graduated subsequent to July, 1917, will be admitted to the examination unless graduated from a medical school rated in Class A by the Council on Medical Education and Hospitals of the American Medical Association. All applicants who graduated from foreign medical schools subsequent to April 4, 1916, must have attended at least one full course of study in a medical school of the United States rated in Class A by the Council."

Another form of the holdover regulations, or restrictions, from the era of go-as-you-please is the prescription of varying minimum totals of hours for the medical course; for example, 3,600 hours in Colorado and Texas, 4,000 hours in Michigan and California, 4,180 in Iowa, and 4,480 in Pennsylvania, and, in the case of states like California and Iowa, a practically hard and fast distribution of these hours among the subjects in the medical curriculum—chemistry, 320 hours in California, 340 in Iowa, and 360 in Michigan, with some possible variation in the last state; pharmacology, 105 hours in California and sixty in Iowa; anatomy, histology, embryology, etc., 775 hours in California, 690 in Iowa, and 720 in Michigan. One practical difficulty that arises in medical schools that attempt to prepare students for a wide market, like those of Chicago, Philadelphia and New York, is the necessity for complying with the various requirements of the state boards by setting their number of hours in a given subject high enough to meet the highest demand of any state. A thoroughgoing and conscientious attempt to build up a curriculum on this principle would lead to the elimination of most of the opportunities which students might claim to make electives according to interest in subjects or according to enthusiasm for a great teacher or research worker.

In the same category of hampering restrictions are those which set up minimum standards of hours a week, weeks a year, and years for the completion of the curriculum. As illustrations: Pennsylvania requires that an acceptable medical college, recognized by its bureau of medical education and licensure, shall give "four courses of at least thirty-two weeks each of thirty-five hours per week of actual work in didactic and clinical study"; Georgia requires four courses amounting to at least 120 weeks, exclusive of holidays, of at least forty hours each week, attendance of at least 80 per cent. of each course, and a grade of 75 per cent. in all college examinations; Connecticut prescribes "four graded courses of instruction, the aggregate of which amounts to at least 104 weeks of at least thirty-six hours each; and at least forty-two months must have elapsed between the beginning of the student's first course of medical lectures and the date of his graduation"; Illinois requires that each term shall consist of not less than 1,020 hours of work, with a maximum of permissible absences of 20 per cent.; and in the case of Colorado the medical course must consist of a minimum term of four years in four separate years of nine months each, with a total of at least 3,600 hours. All these provisions hark back to the time when there was no general and acceptable agency for standardizing—which, by the way, does not mean, and ought not to mean, the enforcement of a rigid and cramping uniformity—and for publishing authoritatively the results of its standardization, for the benefit of the profession and of that vast and vitally interested public which the profession sets itself to serve.

RATING BY THE COUNCIL

The rating of the medical colleges of the country by the Council on Medical Education and Hospitals, though without statutory backing or authority of any sort, has been so thoroughly consistent, courageous, intelligent and considerate, so steadily cooperative with the universities and colleges with which the medical schools have been connected, on the one hand, and so wisely supported by the medical profession, on the other hand, that the judgments of the Council as expressed in its published classification of medical colleges, year by year, are accepted practically without question, save perhaps by those persons and institutions whose merits the Council failed to appraise according to expectations. Very largely through the work of the Council, and with the sure endorsement of an aroused public opinion, the medical school organized on a proprietary basis, and conducted for profit, died.

SOUNDNESS OF CLASS A SCHOOLS

In every way the tendency for medical schools to seek affiliation with, or absorption by, a strong and vigorous university, or for new schools of recent origin to appear as integral parts of an institution of recognized high standards, like the University of Rochester, has operated with unmeasured benefit to medical education. Great institutions whose faithfulness to sound educational standards may not for a moment be called into question, institutions like Cornell University, the University of Chicago, the University of Minnesota, and Stanford University, both institutions on private foundation and those supported by the states, stand sponsor in a wholly new way in the last twenty years for medical education. The confidence of the public, of great educational and philanthropic foundations, and of benevolent men of wealth, as evidenced by the great gifts to medical education during the period just mentioned, all bear convincing testimony to the soundness and progressiveness of the Class A medical schools as a whole, even though there remain differences of magnitude and considerable range between the strongest and the weakest of the probationers on the list. The standards of the universities and the ratings of the Council on Medical Education and Hospitals furnish a safe and tried reliance for anybody wishing to judge medical education. No other agencies than these, save perhaps the New York Regents, are even remotely considered in this connection. Not a single state board is in position to do anything comparable with what the Council has done, nor is it likely to be.

A school in Class A should be judged as a whole—organization, organic institutional relations, faculty, curriculum, equipment and hospital connections; it must also be judged by its output, year after year, its normal finished product, just as the great graduate schools and research organizations are judging the institutions from which their supplies of new men regularly come. When a school has thus attained to the distinction of Class A by the rating of the Council, it seems to a layman entirely clear that state boards must in the long run rely on its honesty, integrity, sound judgment and professional loyalty, and accept its product for immediate examination without questioning meticulously the processes by which its graduates have been guided to their degrees. The judgment of the medical college faculties as to the scientific attainments, the personal trustworthiness and the presumption of success on the part of candidates for degrees is no whit less professional, responsible and public-spirited than that of any board made up of busy practitioners, no matter how distinguished. It is probably within the prerogative of almost every board to approve or not to approve any particular school or all the schools of the Council's Class A or Classes A and B; but having so approved a school or group of schools, there ought to be no further question, and no detailed prescription, as to the exact proportions of the curriculum, or as to the year, whether of thirty or thirty-two weeks, whether it is divided into semesters, terms or quarters, and whether the total accomplishment was spread over fifty months or forty-two months, or thirty-

six months. Attainment on entering the examination is the thing to be assured. On the results of the examinations, year by year, examinations honestly and wisely conducted, perhaps by sections, like the New England states, or the Lake Michigan states, instead of six separate New England examining bodies, or four Midwest bodies, the school must stand or fall. It has more at stake than any board. It must find its faults or weaknesses or vagaries as a part of a greater institution, and take prompt measures to remedy them.

INJUSTICE OF HAMPERING STUDENTS BY DETAILED REQUIREMENTS

The quality of the men and women who are now going into the medical colleges justifies such a proposal of freedom from detailed requirements by boards more perfectly than at any previous time. The process of sifting this mass of students to ascertain its adaptability to the severe discipline of the medical curriculum goes on two years before it gets into the medical hopper, and a good deal of elimination takes place. Not a medical college in Class A would go back to mere high school requirements for admission if it could. On the other hand, with better material to work on, with some momentum in scientific matters and some development of technic at the outset, the school may properly claim the right to work with considerable flexibility of program, with differentiation and even with some specialization of curriculum to meet the needs of groups of students here and there.

For a decade the medical colleges have found it safe to accept from the colleges throughout the country without examination hundreds of freshmen who have stalked into the medical curriculum and have carried their work successfully. These students have satisfied the minimum requirements in science, English and foreign languages, and the colleges have been trusted to make up the balance of the sixty hours with good stuff and not with mere easy fillers. The student, in similar fashion, may pass from the first two years of his medical curriculum in a two-year medical school into the second half of the four-year medical college curriculum, without too elaborate detailed requirements or extensive examinations.

SAVING TIME BY A FLEXIBLE CURRICULUM

Much has been said during recent years of the urgent need to get men into their professional practice at an earlier age. These meetings have heard many addresses on this subject and on the rising cost to the student of his six or seven years of preparation for the practice of medicine after he has graduated from the high school. Scarcely one of these discussions has suggested such a modification of the old-fashioned calendar of the medical curriculum as would assure any saving of time or expense to the student. While colleges and universities have increased their utilization of their plants by adopting a four-quarter year, and while they have enabled many students who have superior ability, especially fine training, and a high enthusiasm for professional achievement, to move more rapidly through the curriculum as a whole, the medical colleges have stood pat for the old-fashioned seven, eight, nine months year. The present rigid prescription or time-lock set by state boards makes impossible the saving of any time by the most brilliant and capable of students. Four calendar years are four calendar years, and the most robust, determined and superbly prepared student may not march through his curriculum, if his destination is Connecticut, in less than forty-two months. He may have taken his physiologic chemistry, bacteriology, histology, embryology, and the like, under the finest masters in a great university in an extra year, an extra semester or in summer sessions, but he may not thereby shorten the sacred period of forty-two months.

It would be entirely feasible for certain medical colleges, perhaps not for all, so to organize their work by rotation and repetition, just as engineering schools and law schools organize their work, that students might finish the prescribed medical curriculum exclusive of the internship in three, three and one-fourth or three and one-half years. While this probably would not be done by the average student or by many students in every institution, the number capable of such saving, and in justice entitled to make it, would undoubtedly be considerable and worth while, and likely to increase. This would result in saving money for the student as well as time; it would thus reduce the handicap of the strong, capable, but necessarily self-supporting student, the young man who comes up through his high school and premedical curriculum by his own efforts, in contrast with his more fortunate fellow student whose family is able without hardship to provide him with a full medical education. The difference of $1,000 in the debt which a student would incur in getting his professional education is not infrequently a determining factor, and the medical profession just now needs to look to the matter of supply of raw material of the right sort.

FREEDOM AND RESPONSIBILITY OF COLLEGES UNDER THE NEW CONDITIONS

Until state boards relax the present outgrown, unnecessary and harmful prescriptions as to the details discussed, the medical colleges and the medical students must follow in the lock-step to their common disadvantage. Freedom and responsibility, under the new conditions in medical education, belong to the medical colleges far more vitally and permanently than to the mere examining boards of forty-eight states. Progress and professional spirit in the coming generations of doctors of medicine depend on the full exercise of these two functions by the medical colleges, almost wholly apart from detailed prescriptions by state statute, regulation or board. Cooperation among the states, the medical school and the Council is more active and cordial than ever before. The present roll of Class A medical colleges shows about 40 per cent. to be vital organs of state governments, and as such they are even more responsible to the state than are the state boards of examiners. The regulations of the boards in twenty-three states now give official sanction to the ratings of the Council. But so long as any considerable number of states insist on continuance of the old order of specifications, restrictions and minute regulations of what belongs properly to college administration, there will be a lowered efficiency in the colleges, and a handicapping of some of the most promising students.

Connecticut July Examination

Dr. Edwin C. M. Hall, secretary, Connecticut Homeopathic Medical Examining Board, reports the written examination held at New Haven, July 11, 1922. The examination covered 7 subjects and included 70 questions. An average of 75 per cent. was required to pass. One candidate took the examination and passed. Two candidates were licensed by reciprocity. The following colleges were represented:

PASSED	Year Grad.	Per Cent.
College		
Hahnemann Medical College and Hospital of Chicago...	(1922)	84

LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
College		
N. Y. Homeo. Med. Coll. and Flower Hosp..	(1882)*, (1921)	New York

* Licensed on diploma.

Connecticut November Examination

Dr. Edwin C. M. Hall, secretary, Connecticut Homeopathic Medical Examining Board, reports that one candidate, a graduate of the Hahnemann Medical College and Hospital of Chicago in 1898, received a license by reciprocity with the state of Illinois at the meeting held at New Haven, Nov. 14, 1922.

Book Notices

A REFERENCE HANDBOOK OF THE MEDICAL SCIENCES EMBRACING THE ENTIRE RANGE OF SCIENTIFIC AND PRACTICAL MEDICINE AND ALLIED SCIENCE. By Various Writers. Fourth edition edited by Thomas Lathrop Stedman, A.M., M.D. Complete in eight volumes. Cloth. Price, $10 per volume (in sets only). New York: William Wood & Co., 1923.

To call this vast accumulation of medical data and information a handbook is in the nature of an anomaly. Within its eight stately volumes are included nearly 4,000 articles, contributed by 445 contributors. There are more than 5,000 small illustrations and some sixty-four full page illustrations in photogravure and in colors. The aim of the work is obviously encyclopedic, and it is probably unique among such works.

The third edition was completed in 1917. Because of the rapid progress in the medical sciences brought about by the war as well as by the extensive researches now being made in many parts of the world, textbooks and reference works pass quickly out of date; constant revisions are necessary if they are to depict accurately the present status of the subjects of which they treat. Because of the great scope of this exceedingly useful reference work, a complete resetting and reprinting would be prohibitive. The changes that have been made, therefore, have been inserted into space made by cutting and condensing material in the third edition, and by adding greatly to the last volume.

Among the new subjects that have been included in the fourth edition are articles on asthma, war neurosis, gunshot wounds, the Schick test, epidemic (lethargic) encephalitis, tularemia, light therapy, basal metabolism and the treatment of wounds. New minor articles deal with new drugs, including barbital, butyn, benzyl benzoate, and nonspecific proteins, and with such new tests as the Sachs-Georgi reaction, the sigma reaction and the colloidal gold reaction. There are, moveover, biographic sketches of Dr. Albert H. Buck, editor of the first two editions of this work, and Drs. Abraham Jacobi, Theodore Janeway, George M. Gould, Sir William Osler and Stephen Smith. The publisher calls special attention to the fact that the materia medica articles have been revised to conform with the latest editions of the pharmacopeia and national formulary. In articles on climatology, the 1920 statistics have been incorporated.

The effort to keep this extensive work up to date is praiseworthy, particularly as it has involved considerable editorial ingenuity to maintain the alphabetical arrangement, and not to make the appendix unduly burdensome as a cross index and reference. As it is, this appendix serves to some extent as a measure of the progress made in the period it covers. Of course, the recent work on ethylene and insulin has been too rapid a development to permit its inclusion in this series.

The list of collaborators includes men who are known for authoritative dicta on the subjects about which they write. For the practitioner far removed from the usual sources of medical reference, for the physician who wishes to be able to consult promptly a reliable general statement on almost any subject in general medical science, and for the literary research worker who wishes a well selected beginning list of references, this encyclopedia is especially commendable.

L'INFECTION BACILLAIRE ET LA TUBERCULOSE CHEZ L'HOMME ET CHEZ LES ANIMAUX. Processus d'infection et de Défense Étude Biologique et Expérimentale. Par A. Calmette. Second edition. Paper. Price, 50 francs net. Pp. 644, with 56 illustrations. Paris: Masson et Cie, 1922.

The second edition differs little from the first. A chapter has been added on chemotherapy, and recent contributions in other fields are briefly described, such as the auto-urine reaction of Wildbolz. For the benefit of those who have not read the first edition, it may be said that this is a high-grade, comprehensive treatment of the nature of tuberculosis, as seen by one who is essentially an investigator and a laboratory man, and one who is particularly interested in the problems of resistance to the infection. Several well written chapters are given to the natural means of defense within the body, and the last quarter of the book is devoted entirely to the subject of immunity. Calmette's own researches in the field of experimental immunization are too well known to require comment. It is worthy of note that he does not stress them in this book to the exclusion of other important investigations. It is to be regretted that a number of important American contributions to this field in recent years fail to receive notice. There are chapters on the mode of action of tuberculin, including an interesting catalogue of tuberculins. A concise statistical study of racial susceptibility to tuberculosis is presented. The new chapter on chemotherapy takes up rather briefly the various groups of chemicals which have been investigated as to their therapeutic action. While Calmette feels that the results are to date virtually negative, he believes that there is no reason for discouragement, for several suggestive leads have been obtained. Particularly the results with iodin warrant the continuation of this line of investigation. Good colored plates are included, and the press work is excellent. The value of the book as a good reference monograph is distinctly impaired, however, by the absence of an index.

MENTAL DEFICIENCY (AMENTIA). By A. F. Tredgold, M.D., M.R.C.P., F.R.S.Ed., Lecturer on Mental Deficiency at London University. Fourth edition. Cloth. Price, $6. Pp. 564, with illustrations. New York: William Wood & Co., 1922.

The fourth edition of this well and favorably known textbook fully maintains the high standards of its predecessors. The changes that have been made are quite extensive, and serve to bring the text fully up to date. The chapters on defective delinquency have been entirely rewritten, and there is an excellent discussion of the advantages of the British Mental Deficiency Act of 1913. The author has also included his schematic outline of mental evolution, which should be found of considerable value in analyzing cases that come under observation. The chapters dealing with clinical examinations and mental tests have also been rewritten with admirable clearness. The subject of mental deficiency is rapidly coming to take the prominent place it deserves in social health problems, and there is great need for conservative and authoritative information. These are nowhere so well presented as in this book. Dr. Tredgold's style is clear and concise, the volume is well printed and admirably illustrated, and the book can be heartily recommended for all who are interested. It cannot be equaled, at least in English, for the use of medical students and practitioners.

THYROID AND THYMUS. By André Crotti, M.D., F.A.C.S., LL.D. Second edition. Half morocco. Price, $15. Pp. 774, with 144 illustrations Philadelphia: Lea & Febiger, 1922.

The first edition of Dr. Crotti's opus appeared in 1918. In the author's preface, it is stated that the second edition consists of a complete revision of the material in the first edition, including practically a rewriting of many chapters. Mrs. Crotti is given credit for writing the chapter on the etiology of simple goiter. The book represents an accumulation of a vast amount of literature on the thyroid, beautifully illustrated, but selected rather indiscriminately and without special critical elimination. One of the most valuable sections of the work is the accumulation of statistical material regarding the distribution of goiter throughout the world. As was pointed out in our previous review, the publishers seem to have gone to undue expense in order to issue a beautiful volume. The book is printed on large sheets of enameled stock; it is profusely illustrated and bound in three-quarters red morocco leather with a red cover. It has a gold leaf top and contains even a red silk ribbon for marking the pages. These are certainly unusual features for a scientific volume.

THE ANATOMY OF THE FEMALE PELVIS, DESCRIPTIVE AND APPLIED. By F. A. Maguire, D.S.O., M.B., Ch.M., Honorary Assistant Gynaecological Surgeon, Royal Prince Alfred Hospital. Paper. Price, 6 shillings. Pp. 115, with 4 illustrations. Sydney: Angus & Robertson, Ltd., 1922.

Thirty-three pages of this pocket manual are devoted to applied anatomy and the technic of physical examination. It is evidently intended to be used in preparation for examination rather than in connection with any thorough study of anatomy.

Medicolegal

Killing Child to Save Suffering—Motives—Petit Mal Defense—Mental Age Theory

(State v. Ehlers (N. J.), 119 Atl. R. 15)

The Court of Errors and Appeals of New Jersey, in affirming a judgment of conviction of murder in the first degree of the defendant, a laborer, 28 years old, for killing his son, aged 6 or 7 years, holds that proof of motive is not essential to support a conviction of murder in the first degree. If the killing is wilful and the result of premeditation and deliberation, it is murder in the first degree, no matter what the defendant's motive may have been, or if he had no motive (used in the sense of self-serving reason) whatsoever. A man, unless not sufficiently sane to know the quality and nature of the act, or that it is wrong, who kills his child to save it from anticipated future suffering and unhappiness, is guilty of murder in the first degree, if the killing is wilful, premeditated and deliberate, although actuated only by motives of pure, even if mistaken, love and kindness.

When, in answer to clear, direct and uncontradicted proof of a wilful, premeditated, deliberate killing, the defense of an epileptic seizure of the petit mal type at the time of the crime, is set up, and the other evidence thereof is of so unconvincing a character as to have little, if any, weight, the mere absence of proof of motive will not suffice to justify a setting aside, as against the weight of the evidence, of a jury's verdict of murder in the first degree. Here the species of alleged epilepsy from which the defendant's expert thought he was suffering was the convenient kind which exhibits no outward telltale symptoms, such as fits or convulsions which accompany the grand mal type, and involves only a temporary secret loss of memory and will power responsibility for a few seconds or a few moments. But the expert said there must be absolute loss of memory during this time, whether short or long, else there is no epilepsy. This being so, there was an absolute explosion of the epilepsy theory, because, according to witnesses, the defendant did remember, only three hours after the shooting, all the details which took place while he was claimed to have been suffering from petit mal.

Expert testimony that an adult defendant in a trial for murder is of the mental age of 12 years, coupled with the further testimony by the same expert that 12 years was the average mental age of our American soldiers in the World War, and that the mental age theory "does not amount to shucks" so far as adults are concerned, the court views as tending to demonstrate that the mental age theory of the medical experts is, at least as applied to adults, based on so arbitrary and unnatural a scale of years as a standard as to be misleading to a layman, and useless, if not actually harmful. In other words, this expert clearly demonstrated, as he frankly admitted, what has been the observation of practically all our judges, that the so-called mental age theory of the experts, at least as applied to adults, is based on so arbitrary and unnatural a scale of ages as to be utterly misleading to a layman and practically useless, if not actually harmful, in the administration of justice by trial by jury.

The Real Question When Defense Is Insanity

(Thomas v. Commonwealth (Ky.), 245 S. W. R. 164)

The Court of Appeals of Kentucky, in affirming a judgment of conviction of murder, says that it must be borne in mind that, to excuse homicide on the ground of insanity, the evidence must be such as to establish the fact that the accused was without sufficient reason at the time to know what he was doing, or to know right from wrong; or that as a result of mental disease he did not, at the time of the homicide, have sufficient power of will to control his actions, and was moved by an insane impulse which he could not resist. The real question in a trial in which the defense is insanity is not whether the mind is unsound, but whether it is unsound to the extent of being unable to determine right from wrong; or whether, if able to determine right from wrong, the accused was unable to resist the impulse to commit the act. If such were not the test, with the many opinions which may be indulged with regard to the soundness or unsoundness of mind, the punishment of criminals would be rendered almost an impossibility. Usually, in a case in which there is no other hope of escape from the enormity of a crime, insanity is put forward as a forlorn hope, and many persons indulge the conclusion that, because a crime is committed from a motive which they may regard as insufficient to justify such an action, the action of the party arises from mental diseases. Insanity is not, however, proved by evidence that the slayer entertained no ill will that was known of by other; by the enormity of the crime; by the barbarous manner in which it was committed, or by the fact that there was no apparent provocation. Testimony that one is of a violent, overbearing and quarrelsome disposition when drunk cannot be said to be evidence of such unsoundness of mind as will excuse crime.

Society Proceedings

COMING MEETINGS

AMERICAN MEDICAL ASSOCIATION, San Francisco, June 25-29. Dr. Olin West, 535 N. Dearborn St., Chicago, Secretary.

American Association for Thoracic Surgery, Chicago, May 29-30. Dr. Charles Gordon Heyd, 46 W. 52d Street, New York City, Secretary.
American Bronchoscopic Society, Atlantic City, May 9. Dr. William B. Chamberlin, Osborn Building, Cleveland, Secretary.
American Climatological and Clinical Association, Niagara Falls, Ont., May 23-25. Dr. Arthur K. Stone, Framingham Center, Mass., Sec'y.
American Gynecological Society, Hot Springs, Va., May 21-23. Dr. A. H. Curtis, 104 South Michigan Avenue, Chicago, Secretary.
American Laryngological Association, Atlantic City, May 16-18. Dr. George M. Coates, 1811 Spruce Street, Philadelphia, Secretary.
American Laryngological, Rhinological and Otological Society, Atlantic City, May 10-12. Dr. W. H. Haskin, 40 E. 41st St., New York, Sec'y.
American Ophthalmological Society, Colorado Springs, June 19-21. Dr. T. B. Holloway, 1819 Chestnut Street, Philadelphia, Secretary.
American Orthopedic Association, Rochester, N. Y., June 7-9. Dr. DeForrest P. Willard, 1630 Spruce Street, Philadelphia, Secretary.
American Pediatric Society, French Lick, Ind., May 31-June 2. Dr. H. C. Carpenter, 1805 Spruce Street, Philadelphia, Secretary.
American Proctologic Society, Los Angeles, June 22-23. Dr. Ralph W. Jackson, 245 Cherry Street, Fall River, Mass., Secretary.
American Society for Clinical Investigation, Atlantic City, April 30. Dr. James H. Means, 15 Chestnut Street, Boston, Secretary.
American Therapeutic Society, San Francisco, June 22-23. Dr. Lewis H. Taylor, The Cecil, Washington, D. C., Secretary.
American Urological Association, Rochester, Minn., May 21-23. Dr. H. G. Hamer, 723 Hume-Mansur Bldg., Indianapolis, Ind., Secretary.
Arizona Medical Association, Grand Canyon, June 21-22. Dr. D. F. Harbridge, Goodrich Bldg., Phoenix, Secretary.
California, Medical Society of the State of, San Francisco, June 21-23. Dr. W. E. Musgrave, Balboa Bldg., San Francisco, Secretary.
Connecticut State Medical Society, New Haven, May 23-24. Dr. C. W. Comfort, Jr., 27 Elm Street, New Haven, Secretary.
Georgia, Medical Associaton of, Savannah, May 2-4. Dr. Allen H. Bunce, Healey Building, Atlanta, Secretary.
Illinois State Medical Society, Decatur, May 15-17. Dr. W. D. Chapman, Silvis, Secretary.
Iowa State Medical Society, Ottumwa, May 9-11. Dr. T. B. Throckmorton, Bankers Trust Building, Des Moines, Secretary.
Maine Medical Association, Houlton, June 5-7. Dr. B. L. Bryant, 265 Hammond Street, Bangor, Secretary.
Massachusetts Medical Society, Pittsfield, June 12-13. Dr. W. L. Burrage, 182 Walnut Street, Brookline 46, Boston, Secretary.
Mississippi State Medical Association, Vicksburg, May 8-9. Dr. T. M. Dye, Clarksdale, Secretary.
Missouri State Medical Association, Joplin, May 8-10. Dr. E. J. Goodwin, 3529 Pine Street, St. Louis, Secretary.
National Tuberculosis Association, Santa Barbara, Calif., June 20-23. Dr. George M. Kober, 370 Seventh Avenue, New York.
Nebraska State Medical Association, Lincoln, May 14-17. Dr. R. B. Adams, 1013 Terminal Building, Lincoln, Secretary.
New Hampshire Medical Society, Concord, May 22-23. Dr. D. E. Sullivan, 7 North State Street, Concord, Secretary.
New Jersey, Medical Society of, Atlantic City, June 21-23. Dr. William J. Chandler, South Orange, Secretary.
New Mexico Medical Society, Albuquerque, June 19-21. Dr. J. W. Elder, Santa Fe Hospital, Albuquerque, Secretary.
North Dakota State Medical Association, Grand Forks, May 31-June 1. Dr. H. J. Rowe, Lisbon, Secretary.
Pacific Northwest Medical Association, Seattle, June 19-21. Dr. F. Epplen, 422 Paulsen Building, Spokane, Secretary.
Radiological Society of North America, San Francisco, June 21-22. Dr. M. J. Sandborn, Appleton, Wis., Secretary.
Rhode Island Medical Society, Providence, June 7. Dr. I. W. Leech, 369 Broad Street, Providence, Secretary.
Texas, State Medical Association of, Fort Worth, May 8-10. Dr. Holman Taylor, 207½ W. 11th Street, Fort Worth, Secretary.
Utah State Medical Association, Salt Lake City, June 20-22. Dr. W. L. Rich, Boston Building, Salt Lake City, Secretary.
West Virginia State Medical Association, Beckley, June 12-14. Dr. Robert A. Ashworth, Moundsville, Secretary.
Wyoming State Medical Society, Laramie, June 20-21. Dr. Earl Whedon, Sheridan, Secretary.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

Archives of Surgery, Chicago

March, 1923, **6**, No. 2

*Benign and Malignant Growths of Nasopharynx and Their Treatment with Radium. S. J. Crowe, J. W. Baylor, Baltimore.—p. 429.
Studies in Exhaustion: IV. Physical Trauma. G. W. Crile, Cleveland.—p. 489.
*Etiology of Urinary Lithiasis: Experimental Study. L. D. Keyser, Rochester, Minn.—p. 525.
*Nature of Cranial Hyperostosis Overlying Endothelioma of Meninges. D. B. Phemister, Chicago.—p. 554.
*Osteoma of Skull. C. W. Rand, Los Angeles.—p. 573.
Alterations in Currents and Absorption of Cerebrospinal Fluid Following Salt Administration. F. E. B. Foley, St. Paul.—p. 587.
Relation Between Oblique Inguinal Hernia and Workmen's Compensation Laws. J. M. Wainwright, Scranton, Pa.—p. 605.
Pathogenic Ptosis of Right Colon. E. P. Quain, Bismarck, N. D.—p. 638.
*Carcinoma of Appendix. A. S. Jackson, Rochester, Minn.—p. 653.

Radium Therapy of Growths of Nasopharynx.—In none of the forty-nine cases of carcinoma of the nasopharynx reported by Crowe and Baylor has a cure been effected; but, in many cases, the symptoms have been ameliorated. In some instances, the rapid decrease in size of the primary growth leads the authors to believe that the unfavorable outcome is due to the fact that these patients do not apply for treatment until metastases have occurred. It is important for the medical profession to know that tumors in the posterior part of the nose and in the nasopharynx are not uncommon, and that the earliest symptoms may be referable to the ear, the eye, the glands of the neck or to the area of distribution of some branch of the trigeminal nerve.

Etiology of Urinary Lithiasis.—The commoner theories of calculus formation are discussed by Keyser on the basis, in most instances, of experimental results. He studied the effect on the crystalline content of the urine of: a high calcium diet; forced administration of oxalic acid and its derivatives; administration of butyl oxalate; placing an organic nucleus in the renal pelvis of the rabbit; the formation of oxamid calculi; anatomic or mechanical factors in the production of oxamid calculi; the introduction of inflammatory exudates into the urinary stream by means of experimental renal infection: the influence of such exudates on the deposition of calcium oxalate and the production of small concretions by such methods; the production of a minute concrement by means of trauma and infection. The difficulty with which calcium salts, oxalates, urates, and other normal crystalline deposits of the urine are increased to any appreciable degree by various methods of administration is pointed out. The only marked increase in visible crystals has been attained by feeding oxamid, a material foreign to the urine of animals. From this it would seem that an exogenous or dietary increase in crystalline materials does not produce a corresponding pathologic increase of these materials in the urine. On this basis, oxalurias, phosphaturias, xanthinurias, cystinurias, and excessive uric acid output must be more of endogenous than of exogenous origin. Some defect of metabolism is at work by which the colloidal content or the hydrogen ion concentration of the urine is altered, rather than a defect of diet. Of the four methods by which artificial concretions have been obtained, only feeding with oxamid gave consistent results. There were features in connection with the other experiments which pointed to the action of an abnormal precipitation mechanism. Oxamid, a crystalloid foreign to the urinary tract, on being excreted, meets no mechanism to keep its crystals separate as morphologic entities. It is precipitated with the colloidal material of normal urine in such a way that fusion of crystals and concrement formation ensue. Mechanical factors are effective, at least, in the case of oxamid, in promoting retention of crystals and growth of the stones; but they are not essential to the process. This work suggests the possible existence of a protective mechanism against stone formation: a natural defense against excessive concentration of urinary crystalloids; protective colloids; precipitation of crystals as isolated units; the form and activity of the urinary tract. Keyser says that there seems to be no other reasonable explanation than that the formation of calculi is due to disturbance of the normal colloidal mechanism of the urine, either in holding water insoluble materials in solution or in precipitating crystals as isolated entities. This disturbance may be due to quantitative or qualitative change in the colloids normally present, or to the entrance of abnormal colloids into the urine, either from the blood stream or as products of local disease in the kidney. The latter origin seems most likely. The fact that pus and exudates of bacterial origin, aside from nephritis, are the most common known sources of pathologic colloidal material in the urine, makes it seem likely that these constitute the factors by which the normal urinary precipitation mechanism is most frequently upset. There is also a possibility that calculi are occasionally due to non-infectious colloidal changes. In stasis, surface duplication, organic nuclei, and diverticula are seen conditions which do not cause stone but which, if the cause of stone is present will greatly favor its growth. This has been demonstrated to be the rôle of mechanical factors in the case of oxamid, and all clinical evidence supports such a view for calculi in human beings. Certain physical, climatic, geographic or physiologic differences, however at times lower the resistance to stone forming infections.

Nature of Cranial Hyperostoses Overlying Endothelioma of Meninges.—Phemister asserts that the hyperostosis which develops over a considerable proportion of meningeal endotheliomas results from penetration of the dura and direct invasion of the skull by the tumor. The tumor permeates the skull, rarefies slightly the inner and outer tables and stimulates new bone formation, usually from both the internal and external surfaces. Tumor cells are found in varying numbers throughout the cancellous spaces of the hyperostosis. The new bone is not tumorous in nature, and is merely ossified stroma of the invading endothelioma. Its spongy or radiating arrangement is similar to that which is seen in the ossification occurring in other types of tumor regardless of whether primary or secondary in bone and whether the new bone itself is of tumorous or nontumorous nature.

Osteoma of Skull.—Two cases are presented by Rand as being representative of types of hyperostosis of the skull. The first case was accompanied by an underlying endothelioma which filled and grew from both sides of the longitudinal sinus. The second case was a simple osteoma of the skull not associated with any true intracranial growth.

Carcinoma of Appendix.—Sixty-four cases are analyzed by Jackson. Operation resulted in cure of the malignant condition in 100 per cent. of the thirty-seven patients (out of sixty-four) traced. In only five of a series of twenty-four cases was a positive surgical diagnosis of carcinoma made, although the lesion was suspected in four other cases. In the whole series of sixty-four cases, one specimen was diagnosed colloid carcinoma; the remaining cases may be classified in the so-called spheroidal group. Adenocarcinoma was not found. The influence of chronic appendicitis as a factor in the production of carcinoma is evident from the appearance of the lumen and the number of twists and kinks in the region of the tumor. Jackson urges that the appendix should be examined carefully in every laparotomy, when possible, and should be removed if any abnormality is present. A preoperative diagnosis of carcinoma of the appendix is impossible because of the absence of distinguishing clinical signs. Obliterated appendixes should be examined carefully for signs of malignancy.

Boston Medical and Surgical Journal

March 29, 1923, **188**, No. 13

Thrombo-Angiitis Obliterans. H. C. Bean, Boston.—p. 427.
Relation of Urologist to Cancer. J. D. Barney, Boston.—p. 431.
*Indications from Experience of Framingham Tuberculosis Treatment. D. B. Armstrong, Framingham, Mass.—p. 433.
Complications Occurring in Gonorrheal Urethritis. A. H. Crosbie, Boston.—p. 435.

Results of Framingham Tuberculosis Experiment.—The more important results of the work done at Framingham, as given by Armstrong, are: (1) The ratio of known active

tuberculosis cases to tuberculosis deaths was increased during the first year of the demonstration from three to one to nine to one, thereby indicating that in many of our communities from one half to two thirds of the active cases are undetected and not under medical control. (2) The cooperation given by the local physicians increased the average annual number of tuberculosis cases reported from 13 to 39 during the first three years of the demonstration. (3) The increased effectiveness of the medical machinery, especially through the aid of the consultation service, increased the percentage of early cases discovered from 45 to 83 per cent. in the first three or four years of the demonstration. (4) Through the increased popularization of adequate treatment facilities, the percentage of cases being sent away to hospitals or sanatoriums for shorter or longer periods, increased during the first three years from 15 per cent. to 42 per cent. (5) As to the effect on mortality, the results to date have been very encouraging. The tuberculosis death rate for 1921, the fifth year of the demonstration, represented a reduction as compared with the predemonstration decade average, of 67 per cent. (the figures being corrected for residence and certification errors). This improvement is to be compared with a percentage of improvement of 18 per cent. for similar towns in Massachusetts. Further, if the last three years of the demonstration (1919-1921) are averaged and compared with the preceding decade, the Framingham improvement is 46 per cent. as compared with 3 per cent. for the comparative so-called "control" towns. (6) Finally, as to cost: Framingham was spending approximately 40 cents per capita per year for health work at the time of the demonstration's initiation. By the gradual assumption of additional expense, the community, either through public or private funds, is now carrying a health expenditure of about $2.30.

Endocrinology, Los Angeles

January, 1923, **7**, No. 1

*New Experimental Data on Question of Seat of Endocrine Function of Testicle. A. Lipschutz, Esthonia.—p. 1.
*Selective Tuberculous Involvement of Endocrine Glands. T. H. Coffen, Portland, Ore.—p. 19.
*Endocrine Therapy in Mental Deficiency. H. W. Potter, Thiells, N. Y.—p. 25.
Experimental Investigation of Value of Various Commercial Ovarian Extracts. S. H. Geist and W. Harris, New York.—p. 41.
*Relation of Onset of Menstruation to Environment. W. Lintz and H. Markow, New York.—p. 57.
Regeneration and Transplantation of Thyroid. M. M. Hoskins, Little Rock, Ark.—p. 61.
Effect of Ablation of Superior Cervical Sympathetic Ganglia on Continuance of Life. M. L. Montgomery, Berkeley, Calif.—p. 74.
Epinephrin Content of Commercial Suprarenal "Cortex" Preparations. E. J. Baumann, New York.—p. 81.
*Case of Raynaud's Disease, Recovered. J. C. Klecan, Portland, Ore.—p. 84.

Seat of Endocrine Function of Testicle.—Lipschutz presents a review of the experiments performed by himself and his co-workers on the interstitial cells of the mammalian testis. Various data are adduced which have not been published previously. It is held that a normal condition of hormonic activity of the testis of mammals is not possible without fully developed interstitial cells. A testis with spermatozoa, but with underdeveloped interstitial cells, cannot perform its normal endocrine function. Completion of spermatogenesis is not necessary for the performance of the endocrine function. Normal endocrine function is possible even when no other generative cells than the cells of Sertoli and spermatogonia are present in the tubules. The hypertrophy of the remaining testis in unilateral castration is not compensatory since small testicular fragments do not hypertrophy and, furthermore, the sex characters can be developed normally when a fragment of only about 1 per cent. is present in the body. The increase of the generative tissue in the testis after unilateral castration has nothing to do with the endocrine function of the testis. It is highly probable that the interstitial cells are producers of sexual hormones; it may be that in extra-uterine life they receive some impulse from the developing generative cells, like the granulosa and the theca interna of the ovary.

Selective Tuberculous Involvement of Endocrine Glands.—The case reported by Coffen is unique in that there was a clinical history of disturbed function of the thyroid, pancreas, suprarenals and probably the hypophysis. Necropsy showed caseous tuberculosis limited to all the endocrine glands. The following points stand out: In a man of large frame (suggesting gigantism) and with marked hirsutism, a tuberculous hypophysis was found. Peculiar bronzing of the hands and wrists and the pigmentation of the buccal mucosa, suggesting Addison's disease, was associated with caseous tuberculosis of the suprarenals. Glycosuria was definitely present more than three years before death; caseous tuberculosis of the pancreas was found at necropsy. A colloid goiter was removed six years before death; caseous tuberculosis of the remaining portions of the thyroid was found at necropsy. A hydrocele operation had been performed ten years before death. Necropsy showed caseous tuberculosis of the right epididymis and prostate.

Endocrine Therapy in Mental Deficiency.—The cases chosen by Potter for glandular treatment belonged to three endocrinopathic groups, namely, the status thymicolymphaticus, the hypothyroid, and the dyspituitary. Immediately before instituting treatment, these patients were examined for height, weight, blood pressure and blood sugar content. Their intelligence was measured by the Terman scale. Symptoms referable to glandular disturbance were observed. Desiccated thyroid and whole gland pituitary substance were given by mouth. Of fifty-two patients, fifteen showed definite improvement. This improvement consisted of an increase of from four to nineteen months as determined by the Terman scale over what could have been predicted considering their rate of progress prior to instituting glandular therapy. The aggregate net gain made by these fifteen patients amounted to 126 months, or an average of 8.4 months for each patient. Close correlation was found between the mental and physical improvement. In every case but one, an improvement in the general physical condition, blood pressure, blood sugar content, or net increase in height and weight was found. Potter warns against drawing hard and fast conclusions. In closing he says: "Let it suffice to say, for those who may be inclined to apply this report too generally, that endocrinology may at some time in the future explain the origin and offer a promise of a certain amount of improvement in only a selected small percentage of our mental defectives. Finally, to regard endocrine therapy as a panacea for mental deficiency would curtail what legitimate use it may subserve."

Relation of Onset of Menstruation to Environment.—The data presented by Lintz and Markow show that, regardless of the size of the town or city, the environment, economic status and occupation, the average age at onset of menstruation remains approximately the same—13½ years.

Recovery from Raynaud's Disease.—In February, 1921, Klecan's patient began to experience an itching pain in both hands. In June both hands became hyperemic—dark purple. In August, the left third finger broke down and later the right thumb. He came under Klecan's care in September, 1921. Both hands were then markedly hyperemic, the fingers almost black purple. The third left finger and right thumb were necrotic (dry necrosis). No distinct demarcation line was present. The Wassermann test was negative. Later a demarcation line became pronounced. Intense pain persisted. At this time Klecan decided to administer anterior pituitary substance. He gave 2 grains (0.12 gm.), three times daily. In a few days the pain decreased to such an extent that the patient remained without morphin for days at a time. The patient gained in appetite and craved bread particularly; one-fourth grain (0.015 gm.) of desiccated thyroid was added during the fourth week. All the fingers revived. The right thumb proved to be necrotic only as far as the soft parts were concerned and healed completely during the fifth week in the hospital. Necrosis of the third left finger involved the bone. The patient left the hospital after two months, having gained 20 pounds in weight. He was free from pain. In January, 1922, his condition, with the exception of the third left finger, was perfect. In March, 1922, the third left finger also healed, being shorter by about one third of the terminal phalanx. At the present time the patient is in perfect physical condition, has a constant weight, is working actively and enjoying life generally.

Indiana State Medical Association Journal, Ft. Wayne

March, 1923, **16**, No. 3

In Memoriam of Dr. Albert Carl Kimberlin and Dr. Frank Barbour Wynn. W. N. Wishard, Indianapolis.—p. 75.
Cataract Extraction and Complications. W. F. Hughes, Indianapolis.—p. 79.
Reconstruction of Perineal Genito-Urinary Childbirth Injuries. F. C. Walker, Indianapolis.—p. 84.
Essentials in Diagnosis and Treatment of Pulmonary Tuberculosis. J. H. Stygall, Indianapolis.—p. 89.
Diseases and Injuries of Hip Joint. G. D. Marshall, Kokomo.—p. 92.
*Sugar in Cerebrospinal Fluid. Preliminary Report on Quantitative Estimation of Sugar in Cerebrospinal Fluid: Referable Especially to Epilepsy. C. D. Humes, Indianapolis.—p. 94.
Administration of Neo-Arsphenamin Without Presence of Third Party. F. W. Cregor and F. M. Gastineau, Indianapolis.—p. 95.

Sugar in Cerebrospinal Fluid in Epilepsy.—Humes has noted that there was an absence of Fehling's reduction in the nonconvalescent state of epilepsy. This suggests to him the possibility that the cerebrospinal fluid has a physiologic as well as a mechanical function. The following questions are under investigation now: If the cerebrospinal fluid is to be considered a filtrate, why is there not a more consistent relation between the quantity of sugar in the blood and spinal fluid? Is there a distinct cerebral metabolism? If normal cerebrospinal fluid carries glucose as a natural constituent, what is the significance of its persistent absence in the nonconvulsive stage of epilepsy? What is the quantitative relation between sugar in spinal fluid and blood in health? A further report is promised.

Johns Hopkins Hospital Bulletin, Baltimore

March, 1923, **34**, No. 385

*Studies of Diabetes Mellitus. I. Respiratory Exchange Following Ingestion of Glucose, Glycerol, Calcium Hexose Phosphate and Calcium Glycerophosphate. W. S. McCann and R. R. Hannon, Baltimore.—p. 73.
Existence of More Than Four Isoagglutinin Groups in Human Blood. Part II. C. G. Guthrie and J. G. Huck, Baltimore.—p. 80. (To be concluded.)
*Influence of Pregnancy in Syphilis. I. Course of Syphilitic Infection in Pregnant Women. J. E. Moore, Baltimore.—p. 89.
Spinal Arachnoid Granulations with Especial Reference to Cerebrospinal Fluid. R. Elman, Baltimore.—p. 99.
*Blood Chemistry in Allergy. R. H. Major, Kansas City, Kan.—p. 104.

Effects of Glucose Ingestion on Respiratory Exchange of Diabetic Subjects.—In a study of the effects of glucose ingestion on the respiratory exchange of diabetic subjects, two types of response were encountered by McCann and Hannon. In the first type of subject, ingestion of glucose resulted in a diminished rate of carbohydrate oxidation. These subjects all improved greatly under treatment, with the development of good carbohydrate tolerance and improved ability to oxidize glucose. A second type of patient, with severe diabetes, was encountered in whom the ingestion of glucose produced a rise of respiratory quotients at a rate similar to that of normal subjects. These subjects were not responsive to treatment with a maintenance diet, low in protein, and balanced as regards ketogenic and antiketogenic factors. The changes in respiratory quotients of diabetic subjects who ingested glycerol were parallel to those produced by the ingestion of glucose in the same subjects. In normal subjects there was no parallelism between the effects of glycerol and glucose. The specific dynamic action of glycerol was negligible in all but one experiment. In this one case an increase in total metabolism of 20 per cent. was observed coincidently with a decrease in respiratory quotient. The differences in the effects of glucose ingestion on the respiratory exchange of patients with severe diabetes mellitus, the authors believe, supports the concept that there are different types of the disease corresponding to faults in different mechanisms. In subjects with impaired ability to oxidize glucose, hexose phosphate entered more readily into oxidation than did glucose alone.

Influence of Pregnancy in Syphilis.—The clinical data supplied by a study of 178 pregnant women with positive blood Wassermann reactions and twenty-two nonpregnant mothers of syphilitic children, Moore says, support the belief that, in all probability, neither Colles' law nor the theory of the paternal transmission of syphilis directly to the fetus are valid. In only 21.5 per cent. of the total 200 cases were all evidences of syphilis (except a positive blood Wassermann) lacking. This study also demonstrated that the factor of pregnancy may cause striking deviations from the usual course of syphilitic infection. If impregnation and infection approximately coincide, or if infection occurs during the course of pregnancy, the patient may develop the usual early manifestations of syphilis which are, however, much milder than if she is infected independently of pregnancy. Of those pregnant patients in whom the probable date of infection could be compared with the type of lesions present, approximately one half behaved toward infection in this manner. A slightly larger proportion of women, if infected with syphilis at about the time of impregnation, fail to develop any of the usual early lesions of syphilis. Under these circumstances, Moore says, it is fair to assume that pregnancy is the factor which suppresses the lesions of the disease. The protection against the early lesions of syphilis afforded by pregnancy may persist over a long period of years, and possibly for a lifetime. Spontaneous cure of syphilis seems, in a few instances, to have been the ultimate result. In those women of this series who developed late syphilis, the viscera, and particularly the cardiovascular apparatus, were especially prone to involvement; whereas tertiary lesions of the skin or bones and neurosyphilis, either clinical or asymptomatic, were rare. In 10 per cent. of the pregnant women with secondary syphilis, the Wassermann reaction was negative. In the women with latent syphilis, it was prone to vacillate markedly without treatment; and in a number of cases, a negative or positive reaction during pregnancy spontaneously changed to the reverse after delivery. The factors possibly responsible for this condition are briefly considered. The nature of the mechanism by which pregnancy causes these alterations in the course of syphilitic infection is unknown. Various possibilities are mentioned.

Blood Chemistry in Allergy.—Horse serum was administered by Major to rabbits to produce an allergic state. Repeated injections produced marked changes from the normal blood chemistry. These changes were more marked when the animal was on a deficiency diet. The blood nonprotein nitrogen, urea and creatinin were increased; the blood chlorids were usually diminished. Urinary studies show that there is usually a diminution in the nitrogen and chlorid excretion and an increase in creatinin on the day following anaphylactic shock. There is evidence that these changes are due both to a renal and an extrarenal factor.

Journal of General Physiology, Baltimore

March, 1923, **5**, No. 4

Circus Movements of Limulus and Tropism Theory. W. H. Cole, Lake Forest, Ill.—p. 417.
Behavior of Chlorids in Cell Sap of Nitella. M. Irwin, Cambridge.—p. 427.
New Viscometer. P. L. du Noüy, New York.—p. 429.
*Rate of Decline of Milk Secretion with Advance of Period of Lactation. S. Brody, A. C. Ragsdale and C. W. Turner, Columbia, Mo.—p. 441.
Rate of Growth of Dairy Cow. II. Growth in Weight After Age of Two Years. S. Brody, A. C. Ragsdale and C. W. Turner, Columbia, Mo.—p. 445.
Reaction of Nereis Virens to Unilateral Tension of Its Musculature. A. R. Moore, New Brunswick, N. Y.—p. 451.
Selective Absorption of Potassium by Animal Cells. III. Effect of Hydrogen Ion Concentration on Retention of Potassium. R. E. Stanton, Providence, R. I.—p. 461.
Comparative Studies on Respiration. XXIV. Effects of Chloroform on Respiration of Dead and of Living Tissue. G. B. Ray, Cambridge, Mass.—p. 469.
Stability of Suspensions of Solid Particles of Proteins and Protective Action of Colloids. J. Loeb, New York.—p. 479.
Membrane Potentials and Cataphoretic Potentials of Proteins. J. Loeb, New York.—p. 505.

Rate of Decline of Milk Secretion During Lactation.—It is shown by Brody, Ragsdale and Turner, that the course of decline of milk secretion with the advance of the period of lactation may be expressed by the equation of a monomolecular chemical reaction; that is, the percentage decline of milk secretion with the advance of the stage of lactation is constant. This substantiates the idea that milk secretion is limited by a chemical reaction, and, in general, brings lactation into the class of processes the speed of which is determined by the concentration of a limiting substance.

Journal of Metabolic Research, Morristown, N. J.

September, 1922, **2**, No. 3

*Arthritis: Blood Gases and Blood Flow. R. Pemberton, B. M. Hendrix and C. Y. Crouter, Philadelphia.—p. 301.
*Influence of Glands with Internal Secretion on Respiratory Exchange: VII. Possible Influence of Suprarenal Involution in Newly Born Infants on Heat Production. D. Marine, B. H. Lowe and A. Cipra, New York.—p. 329.
*Effect of Splenectomy on Respiratory Exchange in Rabbits. D. Marine and E. J. Baumann, New York.—p. 341.
*Animal Experiments on Certain Phases of Lyon-Meltzer Method of Biliary Drainage. J. Friedenwald, J. W. Martindale and F. X. Kearney, Baltimore.—p. 349.
*Vitamin Potency of Cod Liver Oils. III. Potency of Pollock Liver Oil—Early Summer Oils. A. D. Holmes, Boston.—p. 361.
*Quantitative and Qualitative Changes in Islands of Langerhans in Diabetes Mellitus. M. J. Conroy, New Haven, Conn.—p. 367.
*Effects of Insulin on Diabetic Dogs. S. W. Bliss, Morristown, N. J. —p. 385.

Arthritis: Blood Gases and Blood Flow.—Observations have been conducted by Pemberton, Hendrix and Crouter on seventy-seven arthritics and about forty other cases representing apparent health and various types of disease. The methods of analysis employed consisted chiefly in the study of the oxygen content and capacity of the venous blood; the carbon dioxid content; the dissociation curves for oxygen and carbon dioxid; the sugar tolerance; and the rate of blood flow in the hands. These were utilized in connection with fasting, resting subjects and also in connection with the influence of food, exercise, external heat, drugs and other factors. The high incidence of a lowered sugar tolerance in cases of arthritis at large, especially in the more active stage as already described is corroborated. Observations on the blood gases during the condition of such a test and after making brief preliminary use of the tourniquet show that there tends to be a rise in the percentage saturation of the blood for oxygen, if the tolerance for glucose is lowered. The average under these conditions of all percentage saturation points in the thirteen arthritics with a low sugar tolerance was 78.37 per cent.; of the eight arthritics with normal sugar tolerance, 64.06 per cent.; and for the three normal persons with a normal sugar tolerance, 41.81 per cent. Under the conditions of the experiment, the average percentage saturation for the group of seventy-seven fasting arthritics at all stages of the disease, including advanced convalescence, was higher than it was for twelve fasting normals, in the ratio of from 53.68 to 41.71 per cent. In some arthritics the saturation figures reached very high values. The range was from 26 to 97 per cent. for arthritics and from 27 to 51 per cent. for normals. The interpretation made of these findings is that the percentage of oxygen in the peripheral venous blood of fasting arthritics, under the conditions described, is on the average slightly higher and may be very much higher than in fasting normals. The tentative conclusion is advanced that it tends to return to normal with convalescence or recovery in some cases. Attempts to correlate a high percentage saturation of oxygen in the venous blood of the arthritic, with changes in the rate of blood flow have not yet substantiated such a relation.

Influence of Glands with Internal Secretion on Respiratory Exchange.—The Haldane open circuit apparatus was used by Marine, Lowe and Cipra for accurately measuring the respiratory exchange in newly born infants. The average daily heat production for a given normal baby was found to remain fairly constant from the second to the eighth day of life. During the second week of life there is a rise in heat production associated often with the other signs of increased tissue activity. It is suggested that the rise in heat production beginning in the second week of life may be related in some way to the normal destruction of the reticular and fascicular layers of the suprarenal cortex which also begins at this time.

Effect of Splenectomy on Respiratory Exchange.—Rabbits were used by Marine and Baumann in this experimental study. Uncomplicated splenectomy caused a significant rise in heat production in four of fourteen rabbits. The authors do not feel justified at present in assuming the presence of an antagonistic action of the thyroid and spleen.

Animal Experiments with Lyon-Meltzer Method.—Friedenwald, Martindale and Kearney tried to estimate quantitatively the flow of bile (and duodenal contents from a given sector of the duodenum) when stimulated by magnesium sulphate. An anterior gastro-enterostomy was performed on a large dog. A small rubber tube was inserted into the duodenum directly opposite the ampulla of Vater. The intestine was then tied off on each side as close as possible to the tube, leaving a closed pouch of intestine about 2½ inches long. The duodenal contents were then collected at hourly intervals. It was found that magnesium sulphate quantitatively increases the flow of bile when applied locally to the duodenal mucous membrane near the gallbladder opening. The bile flow is produced not by a central action but definitely by a local mechanism. The total intestinal secretion is increased either by central or local action following the instillation of magnesium sulphate, a curve which the bile flow itself does not follow. Contraction of the gallbladder, although carefully watched for, was never noted.

Vitamin Potency of Pollock Liver Oil.—It appears from the data presented by Holmes that the potency of pollock liver oil is slightly greater than that of cod liver oil obtained from codfish of similar physical condition.

Changes in Islands of Langerhans in Diabetes Mellitus.—A thorough study was made by Conroy of all parts of the pancreas in twelve cases of diabetes and twelve controls of similar age, and a less thorough study of ninety-five routine necropsies on nondiabetics. In the diabetic group enumeration of the islands in sections from serial blocks of tissue through the entire organ showed a reduction of about 150 per cent. in the amount of insular tissue. In every case of diabetes there were more or less qualitative changes in the islands, chiefly hyalinization and fibrosis, the latter lesion being quite widespread in some cases. Hyalinization of the islands was seen in only two cases of the nondiabetic group, and in these it was not so marked as in the majority of the diabetic cases. Definite hydropic degeneration of the islands was observed in only one of the diabetic cases and in none of the controls. Changes involving the acinous tissue, particularly interacinous and interlobular fibrosis were seen in both series but were more marked in the diabetic cases. From this study it is concluded that both quantitative and qualitative changes are operative in leading to a functional insufficiency of the insular tissue as manifested by clinical diabetes.

Effects of Insulin on Diabetic Dogs.—The report of Banting and Best concerning the effect of pancreatic extract on totally depancreatized dogs is confirmed by Bliss. Also the observations on the occurrence and symptoms of hypoglycemic collapse following overdosage of insulin, and the susceptibility of depancreatized dogs to this condition. Heavy glycosuria and hyperglycemia were abolished in a partially depancreatized dog by 5 units of insulin. A partially depancreatized dog dying of diabetic coma was not saved by the injection of 16 units of insulin, though the blood sugar was reduced nearly to normal, the acetone nearly disappeared, and no chemical reason for death was apparent. The plasma bicarbonate fell progressively to death and was entirely independent of the acetone values, the insulin injections, and the blood sugar changes. Traces of glycogen were found almost equally in the liver, heart and skeletal muscle at necropsy. It is assumed that the insulin treatment fails in advanced coma because unknown secondary changes prove fatal in spite of the clearing up of the primary diabetic disorder.

Kansas Medical Society Journal, Topeka

March, 1923, **23**, No. 3

Use of Bone Plates and Nails in Treatment of Fractures of Femur and Joint Fractures. E. E. Morrison, Great Bend.—p. 57.
Usual and Unusual Cases of Angina Pectoris. J. A. Buchanan, Pueblo, Colo.—p. 59.
Antigenic Differences of Bacillus Typhosus and Their Relation to Widal Test and Vaccination. C. M. Downs, Lawrence.—p. 63.
Some Aspects of Endocrinology. C. I. Reed, Lawrence.—p. 65.
Raw Serum Wassermann in Small Laboratory. W. E. Burns, Chanute. —p. 67.

New Jersey Medical Society Journal, Orange

March, 1923, **20**, No. 3

Modern Views on Blood Pressure. F. A. Faught, Philadelphia.—p. 73.
Chest Surgery. R. H. Dieffenbach, Newark.—p. 80.

Contemporary Aspects of Medical Ethics. E. J. Marsh, Paterson.—p. 86.
The Feebleminded. E. R. Johnstone, Vineland.—p. 89.
Secondary Low Blood Pressure of an Insidious Type. L. F. Bishop, New York.—p. 93.
Acute Pulmonary Tuberculosis. D. Delfino, Somerville.—p. 94.

Rhode Island Medical Journal, Providence

March, 1923, **6**, No. 3

Twelve Cases of Postoperative Abscess of Lung and Two Cases of Postoperative Pneumonia. H. L. Barnes, Wallum Lake.—p. 35.
Radium Therapy in Cancer, at Institute of Radium, Paris. M. W. Thewlis, Providence.—p. 39.

Southern Medical Journal, Birmingham, Ala.

March, 1923, **16**, No. 3

Medicine. M. L. Graves, Galveston, Texas.—p. 151.
Riddle of Uremia. D. Riesman, Philadelphia.—p. 160.
*Diet in Chronic Nephritis. J. S. McLester, Birmingham.—p. 167.
*Relation of Acidosis to Nitrogen Retention in Experimental Nephritis. D. VanderHoof and C. C. Haskell, Richmond.—p. 170.
Atrophic Conditions Contrasted with Muscular Wasting from Emaciation. B. R. Tucker, Richmond.—p. 176.
Program of Rural Health Work. W. F. Draper, Washington, D. C.—p. 181.
Ten Minutes with Vital Statistics. J. H. Florence, Austin, Texas.—p. 186.
*Experimental Intraperitoneal Division of One Ureter. W. C. Jones, Birmingham, Ala.—p. 188.
Synergistic Analgesia. G. T. Tyler, Jr., Greenville, S. C.—p. 199.
Uterus in Malposition. F. Reder, St. Louis.—p. 202.
Comparative Study of Neisserian Infections in Male and Female Urethra. H. W. McKay and L. C. Todd, Charlotte, N. C.—p. 209.
So-Called Railway Spine. F. W. Carruthers, Little Rock, Ark.—p. 216.
Eye Lesions of Nasal Origin. J. D. Heitger, Louisville.—p. 218.
Technic of Radical Mastoid. F. E. Hasty, Nashville.—p. 227.

Diet in Chronic Nephritis.—To secure maximum nutritive efficiency, McLester says the digestive organs should be protected against abuse. The food should be simple. Pies and other pastries, fried food, all complex, highly seasoned "made dishes," should be interdicted. It is advisable that constipation be prevented and for this reason the diet should include always a sufficient amount of honey, fruits, vegetables, bran and other laxative foods. It seems best to advise a moderate fluid intake of from three to five pints daily, the amount depending somewhat on the climate and the resulting loss of fluid through the skin.

Relation of Acidosis to Nitrogen Retention in Experimental Nephritis.—Van der Hoof and Haskell feel that it cannot be too strongly stressed that alkali administration in supposed cases of acidosis should be resorted to only when it has been definitely shown that there is reduction of reserve alkali of the plasma even then, oral or rectal administration should be preferred to injection of the solution intravenously.

Experimental Division of One Ureter.—Forty animals were used by Jones in his experimental work. The mortality was 75 per cent. It is evident, therefore, that complete division of the ureter is an exceedingly grave occurrence, but not necessarily fatal. As compared with ureteral obstruction, it is decidedly more serious. The added danger from an opened ureter is due mostly to the toxemia from absorption of decomposed urine from the tissues outside the urinary tract. The most striking feature of these experiments as well as those of other investigators, is the activity of the tissues in the vicinity of the severed ureter in preventing the spread of the escaping urine. In some instances the reaction is so prompt that the ureteral opening is sealed at once. More frequently a urinary sac is formed by adhesions between the intestine, omentum, bladder and body wall. This urinary cavity may contract and be obliterated or may remain unchanged indefinitely, or may increase in size; also secondary sacs may develop from the original sac. Limiting adhesions occurred in all but one of the animals. The amount of infection in the peritoneum (21 per cent.), retroperitoneal tissues (13 per cent.) and abdominal wound (15 per cent.) was surprisingly small. The effects of this operation on the kidney and the ureter are the same as those of complete ureteral obstruction if the animal lives long enough, except that the results develop more slowly in the former; also in ureteral division there is the added feature, in about 50 per cent. of the animals, of the formation of a urinary cavity at the point of division of the ureter. During the first two or three months after complete severing of a ureter it gradually dilates and the kidney suffers cystic enlargement. After three or four months, dilatation still continues in more than half the number of animals, while about 44 per cent. of the specimens show more or less marked general renal atrophy (decrease in size) on the operated side.

Tennessee State Medical Association Journal, Nashville

March, 1923, **15**, No. 11

Surgical Control of Exophthalmic Goiter. B. I. Harrison, Knoxville.—p. 473.
Art and Science of Diagnosis. R. L. Motley, Dyersburg.—p. 476.
Common Diseases of Thyroid. J. B. Haskins, Chattanooga.—p. 481.
Treatment of Compound Fractures of Tibia; Report of Three Cases. W. F. Clary, Memphis.—p. 484.
Desensitization After Previous Injections of Serums (Antitoxins, Etc.). J. H. Litterer, Nashville.—p. 485.
Case of Nonpurulent Sinusitis Associated with Chorioretinitis. C. D. Blassingame, Memphis.—p. 493.

Texas State Journal of Medicine, Fort Worth

February, 1923, **13**, No. 10

Determination of Cardiac Efficiency. D. W. Carter, Jr., Dallas.—p. 498.
Determination of Kidney Efficiency. K. M. Lynch, Dallas.—p. 501.
Cardiovascular-Renal Disease: Clinical Considerations. R. B. McBride, Dallas.—p. 505.
Cardiovascular-Renal Disease. J. E. Daniel, Wichita Falls.—p. 507.
Effect of Arsphenamin Treatment in Cardiovascular Syphilis in Negroes. M. D. Levy, Houston.—p. 509.
Early Diagnosis of Diabetes. H. J. John, Cleveland, Ohio.—p. 512.
Dietary Treatment of Diabetes. W. E. Nesbit, San Antonio.—p. 516.
Renal Glycosuria; Report of Case. C. T. Stone, Galveston.—p. 518.
Parasitism of Fat. K. H. Beall, Fort Worth.—p. 520.

March, 1923, **18**, No. 11

Value of Abdominal Measurements in Recognizing the Size and Maturity of Fetus. C. R. Hannah, Dallas.—p. 543.
*Interstitial Pregnancy. T. C. Gilbert, Dallas.—p. 546.
Cesarean Section. H. H. Ogilvie, San Antonio.—p. 548.
Nitrous Oxid in Obstetrics. J. R. Worley, Dallas.—p. 551.
Spinal Anesthesia in Gynecology. W. R. Cooke, Galveston.—p. 554.

Interstitial Pregnancy.—Gilbert records the case of a woman, aged 26, who became aware of a second pregnancy ten months after the birth of her first child. The fetus was expelled, at the end of the fourth month. For three months previously the patient had experienced fulness and distress in the right ovarian region, with more or less pain from time to time, these symptoms gradually increasing in intensity. Gradually, a "cake" appeared in the right flank. The patient had some cramps in the abdomen and marked diarrhea, accompanied by fainting when she attempted to sit up in bed. She showed marked anemia and an unusually dark, muddy and mottled skin, symptoms no doubt, due to an intraperitoneal hemorrhage. About two months later, she felt the tension in her side relax, and the "cake," suddenly went down and there was an escape, according to her estimation, of from a quart to one-half gallon of water. Bimanual examination revealed a large, fixed, boggy uterus, slightly smaller than a four-months' pregnancy. There was a definite tumor mass extending upward and to the right. It was firm in consistency, but did not give the impression of a fibroid. Interstitial pregnancy was diagnosed but the expectant course was pursued. The amount of blood lost was only moderate. The patient experienced intermittent pains, resembling those of labor, and two days later a four-months' fetus was expelled through the uterus. The placenta and membranes, however, did not follow after six hours. The cord was traced to the right cornu, where it was thought it could be felt leaving the uterine cavity, thus confirming the diagnosis of interstitial pregnancy. Notwithstanding this fact, it was decided to temporize still further, and the uterus was packed with iodoform gauze, with the hope that the placenta and membranes would come away upon the removal of the gauze. The gauze was removed after twenty-four hours, without results. The next day the patient became pale, weak and faint, experiencing at the same time some pain. Within a short time her condition became worse, marked pallor, air hunger and shock rapidly supervening. A supravaginal hysterectomy was done, and a large amount of blood was removed from the abdomen. The patient never regained consciousness and died of shock. The gravid tumor had attached itself to the pelvic wall, just to the right of the bladder. The membranes and placenta were definitely within the extra-uterine sac; the cord extended into the uterus.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Brain, London

December, 1922, **45**, Parts 3 and 4

*Two Cases of Syringomyelia and Syringobulbia, Observed Clinically Over Many Years, and Examined Pathologically. J. Taylor, J. G. Greenfield and J. P. Martin.—p. 323.
Study of Cerebral Fiber Systems by Means of New Modification of Anatomic Methods. Lateral Wall of Thalamus and Sagittal Portion of Its Cerebral Fiber System. J. Rosett.—p. 357.
*New Conception of Elements of Sensation. J. S. B. Stopford.—p. 386.
Toxic Polyneuritis. W. Harris.—p. 415.
Muscle Tonus. De Boer's Experiment on Frog. J. W. Langelaan.——p. 434.
Central Connections of Vestibular Nuclei with Corpus Striatum, and Their Significance for Ocular Movements and for Locomotion. L. J. J. Muskens.—p. 455.

Syringomyelia and Syringobulbia.—Two cases of syringomyelia and syringobulbia are reported by Taylor, Greenfield and Martin. They were unusual because of the long periods during which it was possible to observe them carefully. They also have a special interest because of the striking manner in which the clinical course differed in the two cases. In the first patient the condition underwent no change of consequence during the long period of twenty-four years in which one of the authors had him under almost continuous observation; in the second case, which was under observation for nineteen years, there was, on the contrary, a slow but steady deterioration in physical condition with gradual spread of muscular weakness and sensory change, the result no doubt of corresponding changes in the condition of the spinal cord. The morbid changes in the spinal cords, details of which are given, explain to some extent this difference.

New Conception of Elements of Sensation.—In concluding his discussion of this subject, Stopford stresses the following points: It seems clear that no nerve of sufficient size to be of clinical importance, or to be selected for experimental work on sensation, is distributed exclusively to the skin. Consequently, after section of any nerve trunk, even in the distal part of a limb, there is bound to be some disturbance of so-called deep sensibility, and it seems quite impracticable to divide sensation into superficial and deep. The various forms of sensation included under the division of deep sensibility may be dissociated. Observations on the recovery of deep sensibility demonstrate several striking and significant features. What has been regarded as deep sensibility ought to have been subdivided, just as cutaneous sensation has been divided, into an epicritic and a protopathic type. Results of clinical observation suggest that, at the periphery, both in cutaneous and deep tissues, there are cortical and thalamic aspects of sensation.

British Medical Journal, London

March 10, 1923, **1**, No. 3245

Psychology and Medicine. F. W. Mott.—p. 403.
*Outlook of Nephritis in Children. H. T. Ashby.—p. 408.
Ionic Medication. D. Campbell.—p. 409.
*Rheumatoid Arthritis Treated Intravenously with Colon Bacillus Vaccine. R. J. Perkins and G. B. White.—p. 411.
Foreign Bodies in Air and Food Passages. Report of Five Cases. C. A. S. Ridout.—p. 413.
"Lung Splinting" in Treatment of Pulmonary Tuberculosis. S. H. Stewart.—p. 414.

Outlook of Nephritis in Children.—The occurrence of nephritis after scarlet fever, Ashby says, varies in different epidemics, but it may be estimated at about 10 per cent. The outlook is usually good, and it is rare for the nephritis to become chronic. The amount of albumin in the urine does not seem to alter the outlook, for a patient with a large amount may get quite well while one with only a small amount may do badly. The worst cases are those which have remained untreated for some days and those in which there is suppression of urine, as uremia is liable to occur. The preventive treatment consists in great care during the two and three weeks after the onset of the scarlet fever, especially as regards catching cold. In cases of acute nephritis, the outlook is mostly bad. They run a course of, perhaps, from three months to two years, but complete restoration to health does not often occur. The child may get fairly well, but he is liable to further attacks which damage the kidneys still more, till he grows waterlogged and dies. Toward the end very little urine is passed, and dyspnea becomes a marked feature, so that the patient has to be propped up in bed. Uremic convulsions are also common.

Rheumatoid Arthritis Treated with Colon Bacillus Vaccine.—Frequently, the focus of infection in rheumatoid arthritis is difficult to locate, and, it was in these cases that the protein shock method by the intravenous use of *Bacillus coli* vaccine was employed by Perkins and White. This particular vaccine was used because it is convenient to administer, and the material for its preparation is always easily obtainable. The vaccine was given intravenously in doses varying from 50 to 200 millions for a first dose; the patient was admitted to hospital for twenty-four hours, as it was considered that the reaction was too severe for him safely to remain an outpatient while it was in progress. The initial dose should be as large as possible. The reaction usually consisted of a rise of temperature a few hours after the injection, the temperature varying from 100 to 103 F., and frequently accompanied by a rigor. Nausea and vomiting may also occur. The duration of the reaction varies from twelve hours to two days. If any improvement as a result of the treatment is to take place, it does so rapidly, as a rule, within two days. Cases with severe reaction showed the best results.

March 17, 1923, **1**, No. 3246

Man's Posture: Its Evolution and Disorders. A. Keith.—p. 451.
*Nature of Arteriosclerosis. G. Evans.—p. 454.
Trephination of Living Human Skull in Prehistoric Times. T. W. Parry.—p. 457.
Value of Laboratory Tests in Diseases of Liver and Pancreas. W. L. Brown.—p. 461.
*Use of Radium in Treatment of Disease. D. Turner.—p. 464.
*Sudden Death from Anaphylactic Shock. F. W. Sumner.—p. 465.
Amputation at Shoulder. F. R. Parakh.—p. 467.

Nature of Arteriosclerosis.—The main feature of diffuse hyperplastic sclerosis, as described by Evans, is a thickening of the intima, accompanied sometimes by hypertrophy of the media. The intimal changes are the essential lesion. Activity of the endothelial cells is largely responsible for the intimal thickening. In this thickening the process of degeneration plays a secondary part; it is only certainly present in the terminal arterioles of the kidney and the smallest vessels of the other organs. The characteristic feature of the lesion is intense tissue activity, the antithesis of a process of decay.

Indications for Use of Radium in Treatment of Disease.—Of malignant affections: rodent ulcers, epithelioma, lymphosarcoma, spindle cell sarcoma, malignant disease of the cervix, sarcoma of the nasal passages; and of nonmalignant affections: exophthalmic goiter, early keloids and certain nevi are, in Turner's experience, very amenable to radium treatment. They might be termed first class subjects, because, under favorable conditions, they admit of actual cure. Under second class subjects—meaning thereby conditions which may be ameliorated but in which cure can rarely be expected—might be placed carcinoma, lymphadenoma, and splenomedullary leukemia. In the treatment of exophthalmic goiter and of nevi in children by radiation, Turner asserts that radium has the following advantages as compared with the rays: (1) Absolutely constant emission of rays, and, therefore, exact dosage possible. (2) Greater penetration of its rays, so that the deeper parts are reached. (3) Saving of time, as the radiation is maintained night and day until the necessary dose has been administered. (4) No noisy, exciting apparatus, so that the treatment can be applied at the bedside without in any way alarming or disturbing the patient.

Sudden Death from Anaphylactic Shock Following Injection of Diphtheria Antitoxin.—In the case cited by Sumner, anaphylaxis followed injection of a prophylactic dose of 1,000 units of antitoxin. The girl had had no previous injection of any sort. None of the ten other girls had any anaphylactic symptoms, nor had the diphtheria patient, who was given a large curative dose. Death occurred within five minutes after the injection. Subsequent investigation disclosed the likelihood of a condition of "status lymphaticus" with probable enlargement of the tonsils, and adenoids, and a persistent thymus.

Calcutta Medical Journal

December, 1922, **17**, No. 6

Complications After Some Cataract Operations. S. K. Ganguly.—p. 249.
Eclampsia. S. K. Gupta.—p. 262.
Case of Persistent Thymus. A. Chakraverti.—p. 280.
Leprosy. Early Lesions and Development and Incidence of Leprosy in Children of Lepers. D. Banerji.—p. 282.

Lancet, London

March 10, 1923, **1**, No. 5193

*Therapeutic Inoculation. Part III. L. Colebrook, E. J. Storer and A. E. Wright.—p. 473.
*Artificial Pneumothorax: Its Application to Cases Other Than Those of Pulmonary Tuberculosis. J. J. Perkins and L. S. T. Burrell.—p. 478.
*Fatal Case of Prerenal Toxemia, Showing Clinical Signs of Chronic Parenchymatous Nephritis. W. N. Goldschmidt.—p. 480.
*Effect of Histamin on Human Gastric Secretion. A. R. Matheson and S. E. Ammon.—p. 482.
*Fatal Case of Acute Intestinal Obstruction, Resulting from Traumatic Diaphragmatic Hernia. B. H. Slater and C. Mackenzie.—p. 484.
Operative Treatment of Septic Meningitis. H. L. Martyn.—p. 485.
*Suppurative Arthritis Simulating Acute Appendicitis. J. A. Berry.—p. 486.

Therapeutic Inoculation.—In concluding this series of articles, Wright and his associates emphasize two points. The first has reference to the question of the therapeutic prospects opened up. Experiments have brought into prominence the fact that, in immunization, quantitative considerations dominate the situation. When it is desired to evoke immunizing response in the blood one must employ one particular range of doses. And when it is desired to ascertain what has been achieved, one must again employ one particular range of doses. In the experiments incorporated in this paper the increased antibacterial power engendered runs, as calculation shows, generally into the killing of several additional hundreds or exceptionally several additional thousands of staphylococci per cubic centimeter. These figures give upper and lower limits. Within that range there is much useful therapeutic work to be accomplished. But just as there is an assaying dose of living microbes which no immunized blood can contend against, so there must be a definite limit to the volume of infection which intravenous inoculation of vaccines, or immunotransfusion can cope with. And in computing that volume of infection one must take into reckoning not only the microbes actually circulating in the blood, but the total bacterial population in the internal organs, which may run into indefinite millions. The second point made is that in every code of principles there are tenets based only on inference as well as tenets based on direct experiment. But in every succeeding code those elements which rest on inference grow less and less, and those which rest directly on fact—those which are established by laboratory methods—grow more and more. So that in the end, in every science, enduring principles will be reached.

Artificial Pneumothorax for Nontuberculosis Cases.—Perkins and Burrell cite cases to show that artificial pneumothorax may be of value in cases of abscess of the lung, bronchiectasis, hemoptysis of unknown origin, and recurrent pleural effusion. In abscess of the lung, the success of artificial pneumothorax evidently depends on the presence or absence of adhesions. When these are absent artificial pneumothorax is sufficient to effect a cure and render a severer operation unnecessary. Considering the uncertainty of discovering the abscess cavity it is certainly to be preferred to drainage. When the abscess is superficial, the presence of adhesions may lead, under pneumothorax, to its intrapleural rupture necessitating drainage of the pleura. If the adhesions are widespread they may stand in the way of complete collapse and prevent success, necessitating thoracoplasty. But even so, the authors advocate artificial pneumothorax as a routine procedure on the ground that it may be sufficient in itself and, when not, that the symptoms are relieved and the general condition of the patient improved, enabling him better to face the severer operation. Success in bronchiectasis, as in abscess of the lung, depends on adhesions. In the cases of recurrent hemoptysis and chronic effusion success was striking.

Fatal Case of Prerenal Toxemia.—Goldschmidt relates the case of a man who died from an illness the symptoms of which were typically those which have been attributed to "chronic parenchymatous nephritis"; but his kidneys were found at the postmortem examination to be normal macroscopically, and virtually normal microscopically. The heart was very small and in a condition of brown atrophy—always looked on as a secondary phenomenon, not as a primary morbus cordis—but the heart actually showed considerably more evidence of disease than the kidneys. Incidentally, there were no signs of renal inefficiency during the earlier and greater part of the illness, except oliguria, albuminuria and diminished excretion of chlorids. It is of great importance to note that, although toward the end of the illness the kidneys were only slightly, or possibly not at all, damaged, the blood urea rose, so that an abnormally large amount of urea may be present in the blood with slight or no changes in the kidneys. It, therefore, seems as if this man's illness was due to some prerenal poison which caused exudation into the tissues, and incidentally damaged some of the tubules of the right kidney; but the latter had recovered by the time the man died.

Effect of Histamin on Human Gastric Secretion.—Matheson and Ammon state that histamin in small doses given subcutaneously excites in man a flow of gastric juice. The peptic activity increases after the injection and reaches its maximum, usually in from five to fifteen minutes. Both total and free hydrochloric acid increase in amounts attaining the maximum shortly after the pepsin maximum is registered. The secretory rate follows a similar course, and usually attains its maximum last of all. It seems possible to the authors that histamin may be employed as a means of investigating the state of gastric secretory function and, perhaps, as a therapeutic agent.

Fatal Case of Acute Intestinal Obstruction.—The patient whose case is reported by Slater and Mackenzie suffered a war wound of the diaphragm in 1917, that did not heal. His perfect health and perfect digestion for three years after receiving the wound suggests that up to 1921 no abdominal viscus herniated through the hole. Operation for acute intestinal obstruction in 1921 showed that only a small portion of the transverse colon was obstructed, but empyema resulted from infection from the obstructed part of the colon. The probable result of the empyema was to enlarge the hole in the diaphragm. The man was readmitted to hospital in 1922, with a provisional diagnosis of ptomaine poisoning. Death occurred suddenly four days later. The necropsy disclosed that the cardiac end of the stomach and the transverse colon had herniated through the hole, and were adherent to the posterior wall of the thorax. The lower lobe of the left lung was collapsed and universally adherent. The small intestines were slightly distended and congested. All other organs appeared to be healthy.

Suppurative Arthritis Simulating Acute Appendicitis.—In Berry's case a suppurative arthritis of the eleventh right costovertebral joint simulated acute appendicitis.

Medical Journal of Australia, Sydney

1: 169-196 (Feb. 17) 1923

Puerperal Sepsis. T. W. Lipscomb.—p. 169.
Some Relations of Climate, Weather and Fat Covering to Metabolism. C. E. Corlette.—p. 172.
Vesicovaginal Fistula. G. Armstrong.—p. 182.

1: 197-220 (Feb. 24) 1923

Case of Peri-Arteritis Nodosa. J. B. Cleland.—p. 197.
Interim Report on Results of Deep Roentgen-Ray Treatment. H. Flecker.—p. 201.
Gynecologic Experiences in Southern Manchuria. A. N. Krakowsky.—p. 204.
Vitamins. S. Harrison.—p. 206.

Medical Journal of South Africa, Johannesburg

18: 163-186 (Feb.) 1923

Hospital Control. R. P. Mackenzie.—p. 164.
Postpartum Hemorrhage. A. Abelheim.—p. 167.
Estimation of Malnutrition in Children. C. L. Leipoldt.—p. 170.
Uterine Displacements. O. J. Currie.—p. 175.

South African Medical Record, Cape Town

21: 73-96 (Feb. 24) 1923

Widal versus Complement Fixation. A. Pijper.—p. 74.
Treatment and Prevention of Malaria. H. A. Spencer.—p. 84.

Gynécologie et Obstétrique, Paris

January, 1923, **7**, No. 1

*Action of Roentgen Rays on the Oöcytes. A. Lacassagne and H. Coutard.—p. 1.
Cysts of the Labia Minora. H. Mondor and P. Huet.—p. 26.
Conservative Treatment of Inversion of Uterus. Miginiac.—p. 37.
*Pulse in Retroplacental Hemorrhage. Levant and L. Portes.—p. 43.
*"Uteroplacental Apoplexy." L. Portes.—p. 56.

Influence of Irradiation of Ovary on Subsequent Fecundation and Pregnancies.—Lacassagne and Coutard irradiated the ovaries of rabbits and studied the after-effects. They found that even a single and weak irradiation influences the subsequent faculty of procreation very unfavorably. These results are important with regard to the treatment of young women for hemorrhages. It is impossible to stop them without hurting the procreative function.

The Pulse in Retroplacental Hemorrhage.—Levant and Portes found that the pulse with retroplacental hemorrhages is not always very rapid. Other factors (toxemia) influence the rhythm and the frequency of the pulse, so that no direct conclusions are possible as to the part played by the hemorrhage. Yet this does not change the indications for treatment which should consist in the evacuation of the uterus.

Uteroplacental Hemorrhage.—Portes deals with the etiology and treatment of this condition, when the hemorrhage is not only behind the placenta but also in the wall of the uterus. He believes in the toxemic origin. It is theoretically impossible to differentiate this condition from a simple retroplacental hemorrhage. Yet in practice we diagnose it if such symptoms are accompanied by very pronounced toxemia, a shock, or tetanus of the uterus. The treatment of choice is abdominal cesarean section with extirpation of the uterus, except where the lesions are very small or when the uterus contracts normally after evacuation.

Revue Médicale de la Suisse Romande, Geneva

January, 1923, **43**, No. 1

*Sequelae of Epidemic Encephalitis. F. Naville.—p. 1.
*Multiple Sclerosis and Its Etiology. E. Long.—p. 27.
*Semeiology of Heart Disease in Children. E. Thomas.—p. 37.
Transmission to Auricle of Mitral Murmur. M. Roch.—p. 44.
Post Partum Paralytic Ileus. Picot and Francken.—p. 46.
Traumatic Phlebitis. N. Betchov.—p. 48.

Epidemic Encephalitis.—Naville estimates that there must have been from 150 to 200 cases of encephalitis at Geneva during the epidemic of 1918 to 1921, and 43 of the patients are known to have probably permanent sequelae. He encountered also 11 others with a history of encephalitis elsewhere, a total of 54 cases. His conclusions harmonize with those of others who have reported that from 15 to 20 per cent. die during the acute phase, and complete recovery follows in only 30 to 40 per cent. of the well defined cases. Whenever parkinsonian symptoms are observed outside of the first stage of the disease, it is almost certain to entail disability. Notwithstanding the great diversity in the clinical picture of the disease at first, there is a great sameness in the sequelae. They are either of the parkinsonian type, with contracture, or there is a psychomotor and mental inertia, without contracture. This latter type is twice as common as the parkinsonian form, and the outlook for recovery is graver. In children, the prognosis of the mental disturbances cannot be determined as yet. In 5 children the sequelae were of the parkinsonian type; in 4 others, of the insomnia-excitement type. Naville reiterates that the sequelae of epidemic encephalitis are absolutely pathognomonic. They form new clinical pictures not known before.

Multiple Sclerosis.—This article is an introduction to the collective inquiry in regard to multiple sclerosis, which is now under way in Switzerland as mentioned recently in the News department. Long comments on the meager results from treatment, even with sodium cacodylate in large doses, while arsphenamin has proved even more disappointing.

The Heart in Children.—Thomas analyzes the 8 cases of organic heart disease he discovered in a medical inspection of 747 boys and 757 girls. He found functional murmurs in 4 per cent. of the girls but in none of the boys. The nonorganic murmurs usually subsided under the oculocardiac reflex, but this did not modify the organic murmurs. The latter persisted in 3 of the children; they became exaggerated in 2, and attenuated in 3, but never disappeared entirely. The nonorganic murmurs disappeared in 18 cases; became attenuated in 8, and dubious in one case. They persisted in only one of the total 28 cases.

Archivio Italiano di Chirurgia, Bologna

January, 1923, **6**, No. 6

*Hernia of the Bladder in Children. C. Oliva.—p. 533.
*Ligation of Plantar Arch. G. B. Macaggi.—p. 565.
*Cancer Secondary to Lymphogranuloma. V. Ferrero.—p. 577.
*Lipoma of the Intestine. C. Vaccari.—p. 589.
*Cancer of Rectum and Prostate. G. D'Agata.—p. 602.
*Purulent Pericarditis in Child. C. Gamberini.—p. 619.
Transactions of 1922 Italian Surgical Congress.—p. 637.
Idem Orthopedic Congress.—p. 706.
Idem Urologic Congress.—p. 715.

Hernia of the Bladder in Children.—Oliva gives the details of sixteen cases of hernia in children under 12 with the bladder included in the hernial sac, published by Pott in 1790 and others since. The hernia in these cases was inguinal. He then describes two cases in his own practice in a girl of 10 and a boy of 8. The hernia was of the femoral type. All the eighteen children recovered after the operation. In all but two of the cases the hernia was on the right side, and the patients were all boys but one. He warns that when a toughness of the tissues or a lipoma is found deep in the hernia, the possibility of involvement of the bladder should be borne in mind, especially when traction on the hernial sac induces a desire to urinate.

Ligation of the Plantar Arch.—Macaggi describes, with illustrations, the simple technic for ligation of the arch formed by the external plantar artery and the dorsalis pedis through the second interosseous space, reaching it through the dorsum of the foot. He has previously described a similar technic for ligating the palmar arch through the dorsum of the hand, in the second and third interosseous spaces.

Multiple Blastoma of the Lymph Glands.—The retrospective diagnosis in the case reported by Ferrero was that the malignant disease had developed from lymphogranuloma, and had spread to involve a large part of the lymphatic system. The patient was a man aged 32 whose brother is said to have died from sarcoma of the lymph glands. Sarcomatous tissue was evident at various points in Ferrero's case.

Lipoma of the Intestine.—Vaccari adds one more case to the total of sixty-nine he has compiled from the literature. In his case there was both a subserous and a submucous lipoma.

Cancer of Rectum Involving Tuberculous Prostate.—D'Agata describes the technic with which he resected the rectum and removed the prostate and the seminal vesicles. The prostate and vesicles showed advanced tuberculous lesions evidently preceding the encroachment of the adenocarcinoma in the rectum. The man aged 57 is now, nearly a year later, in good health; the anus is continent.

Pericardiotomy for Purulen Pericarditis. — Gamberini relates the case of a boy aged 7 brought to the hospital with high fever, general cyanosis, extreme dyspnea and tachycardia. Puncture in the precordial area released pus but this did not give much relief. Then the pericardium was incised, and 300 c.c. of pus escaped. The main symptoms subsided, but the fever persisted. Sixteen days later the sternum was resected and the multiple purulent foci in the pericardium were cleared out and drained both from front and back. Fistulas and fever persisted for five or six months and the child was wasted to a skeleton, but then all symptoms disappeared and he is now, four years later, in florid health.

Revista Española de Medicina y Cirugía, Barcelona

January, 1923, **6**, No. 55

*Surgical Treatment of Cholecystitis. E. Ribas Ribas.—p. 1.
*Complications of Chronic Mastoiditis. J. Vila de Abadal.—p. 18.

Surgical Treatment of Cholecystitis.—Ribas advised operative treatment in 56 of his 64 cases of gallbladder disease in the last two years, but only 41 consented. Colic in the liver region signifies migration of gallstones, but liver colic can occur in the absence of calculi, as a reaction from the gall-

bladder. On the other hand, cholecystitis may develop without liver colic. Incipient gallbladder disease may induce a set of vague symptoms, predominantly gastric. As the general health soon suffers, tuberculosis may be suspected. Ribas declares that no one should die in consequence of cholelithiasis, but the death rate is still high as the disturbances are not traced to the gallbladder until irreparable damage has been done. To wait for complications is to invite disaster. In 2 of his cases, gastric hemorrhage, and in one case intestinal hemorrhage, were cured by removal of the gallbladder. In one woman, aged 35, the pains and hemorrhages had persisted after gastro-enterostomy, but were cured by cholecystectomy. Ribas reiterates that jaundice is not a symptom of gallstone disease; it represents a complication. When it appears, there is danger. In 4 of his cases the gallbladder was of the "strawberry" type. The pains were severe although there were no gallstones, adhesions or distension. He gives colored plates of the findings in this group. In his 2 cases of gallstone obstruction of the common bile duct, the emaciation had progressed so rapidly that the operation had been deferred at first on the assumption of malignant disease. In 5 cases of typical liver colic, the operation failed to reveal either gallstones or cholecystitis. The stagnation of the bile had distended the gallbladder and entailed obstruction of the cystic duct. Complete cure was realized after removal of the gallbladder. His experience with 200 gallstone cholecystitis cases has confirmed the wisdom of reducing the intoxication, flushing the organism with water and giving tonics and stimulants to get the patient into a better condition before operating.

Frequency of Intracranial Complications of Chronic Mastoiditis.—Vila de Abadal summarizes the details of nineteen cases of chronic suppurative otitis in the last two years in which intracranial complications developed. In three other cases the clinical picture seemed to indicate intracranial complications, but the course revealed that the disturbances were due to influenza with neuralgia in the skull, ears and teeth, with pulmonary and pleural complications. All recovered.

Archiv für Verdauungs-Krankheiten, Berlin

January, 1923, **30**, No. 5-6

*Anacidity. E. Schütz.—p. 233.
*Sounds in the Stomach. G. Ganter.—p. 251.
*Hyperacidity and Duodenal Ulcer. I. Boas.—p. 257.
*Peptic Ulcer and Exclusion of the Pylorus. Haberer.—p. 275.
Pathology of Vegetative Nervous System in Severe Colitis. F. Kleeblatt.—p. 287.
*Excretion of Dyes Through the Stomach. R. Finkelstein.—p. 299.
*Idem Through the Pancreas. Giichiro.—p. 302.
Carcinomatous Duodenal Ulcer. L. Disqué Jun.—p. 306.
*Total Chlorin of Gastric Juice. H. Wiener.—p. 309.

Gastric Anacidity.—Schütz comments on the uncertainties as to the etiology of anacidity. He does not consider it an early sign of carcinoma.

Origin and Treatment of Noises in the Stomach.—Ganter's case of aerophagia presented at times a spastic hour-glass shape of the stomach. The play of the diaphragm during abdominal breathing pressed the air through the narrow space and caused loud sounds. They did not occur when the patient changed the type of breathing from abdominal to thoracic. By this simple means the annoying borborygmus was abolished.

Subjective Disturbances from Hyperacidity and Parapyloric Ulcer.—Boas declares that the finding of an ulcer scar cannot be regarded as proof that the ulcer was the cause of the pains; only florid ulcers testify to this. Gastralgic hyperacidity and the clinical picture of parapyloric ulcer present much the same set of symptoms, but they can usually be differentiated by the following signs: The gastralgic form of hyperacidity does not influence the whole organism unfavorably, even when it persists for years. The character and duration of the pains do not change with simple hyperacidity, while with an ulcer the attacks grow longer and longer until the pain is almost continuous. The night pains are especially constant. Elimination of coffee, tobacco, salts, spices and condiments, and restricting the diet to milk and vegetables arrest the pains with hyperacidity, but not in cases of ulcer. The importance of distinguishing between a duodenal ulcer and a gastric ulcer near the pylorus is largely overestimated.

Peptic Jejunal Ulcer and Exclusion of the Pylorus.—Haberer reiterates his opinion that exclusion of all the pyloric glands does not prevent peptic ulceration in the jejunum. This may occur after any and every method of exclusion of the pylorus.

Excretion of Dyes Through the Stomach.—Finkelstein tested gastric excretion with various dyes on dogs with a Pawlow fistula. Of the eight dyes tested, neutral red was the only one that was excreted in the stomach. Phenoltetrachlorphthalein did not appear. The excretion of the neutral red became evident twenty-five minutes after a subcutaneous injection of 50 mg. of the stain. The other dyes did not appear in the stomach contents even when the stomach had been irritated by hypertonic solutions.

Excretion of Dyes Through the Pancreas.—Giichiro tested the pancreatic excretion of dyes in a dog with a permanent fistula of the lower pancreatic duct (Pawlow's method). Nine dyes were thus tested, but methylene blue was the only one that appeared in the pancreatic juice, and this only in traces. The excretion began in about forty minutes and persisted for 150 minutes.

Total Chlorin of the Gastric Contents as Aid in Differential Diagnosis.—Wiener examined the gastric juice from thirty-three patients in the usual way and also determined the total chlorin content. His data confirm Reissner's findings that a high chlorin content (0.34 to 0.58 per cent. in six cancer cases) with low acidity testifies to malignant disease and against simple achylia (0.03 to 0.14 per cent. in eight simple achylia cases). This high chlorin content is not due to neutralization of excreted hydrochloric acid by products of the cancer, as some authors have suggested. In simple achylia, ingested hydrochloric acid is neutralized in exactly the same way.

Deutsche Zeitschrift für Chirurgie, Leipzig

January, 1923, **177**, No. 1-2

*Surgery of Gastric and Duodenal Ulcers. T. Beer.—p. 1.
*Testicle Grafting. H. Burckhardt and F. C. Hilgenberg.—p. 43.
*Treatment of Old Empyema. Esau.—p. 55.
*Treatment of Injuries of Male Urethra. M. Jastram.—p. 70.
*Ischemic Contracture of Muscles. R. Göbell.—p. 106.
*Early Diagnosis of Acute Pancreatitis. E. Glass.—p. 123.
Recklinghausen's Disease Involving the Bladder. Steden.—p. 137.

Surgery of Gastric and Duodenal Ulcers and Their Complications.—Beer reviews the ultimate outcome in a large proportion of 146 cases given operative treatment from 1912 to 1920. He concludes from study of the six cases of postoperative peptic ulcer in the jejunum, that the location of the ulcer in the duodenum is the essential factor. The irritation from the duodenal ulcer left in the organism stimulates excessive secretion in the stomach. In the cases of so-called cicatricial stenosis of the pylorus, some ulcerative process in the duodenum was probably the primary lesion. This was probably the case in three of his postoperative peptic ulcer cases, and in the other three there had been a frank duodenal ulcer. Radical resection of the duodenal ulcer is prophylaxis against peptic ulcer. His extensive research on the "gastric channel" that is, the short cut from cardia to pylorus, failed to confirm this as the main route of transport. Hence there is no reason for assuming that lesions predisposing to ulcer develop particularly in this region. The narrower portions of the stomach, such as the isthmus and pylorus, are the predisposed regions, and removal of them is treatment of the cause.

Experimental Testis Grafting.—The work was done on rats at the surgical clinic at Marburg. The results were very variable, but the paucity of results on the whole was striking. In the entire eight series of experiments nearly the whole of the testis graft was destroyed. The only practical conclusion the authors draw is that homoplastic transplantation of testes can be safely attempted in man, but the results are those to which we were accustomed before the Steinach era. In case of total castration on account of tuberculosis, it might be advisable to transplant elsewhere in the body apparently healthy portions of the removed testes. But even under these conditions, functional success is by no means certain.

Treatment of Old Empyema.—Esau clears out the cavity and lines it with a skin-muscle flap from near by, after resection of ribs. He asserts that an empyema fistula should never be left to heal spontaneously.

Treatment of Injury of Male Urethra.—Jastram gives details of twenty-one severe cases and principles for treatment. He advises cautious introduction of a soft catheter at once, leaving it for a retention catheter if infection is not present. With severe infection cystostomy should precede this. The retention catheter should be used after external urethrotomy, preferably with an arrangement for aspiration.

Ischemic Contracture of Muscles.—Göbell advocates free transplantation of muscle in treatment of ischemic contracture. His eighteen illustrations show the technic and the excellent results realized in the three cases described.

Early Diagnosis of Acute Pancreatitis.—Glass here reports his third case of acute hemorrhagic pancreatitis with fat tissue necrosis and recovery after drainage of the pancreas and small pelvis, without slitting the pancreas capsule. He ascribes his success to early diagnosis. It was based on the important symptom of persistent pain in the upper abdomen, increasing in intensity every fifteen minutes or less but never subsiding completely. The right upper rectus was taut, and a transverse, tender, tumor-like resistance could be felt above the umbilicus, corresponding to the site of the pancreas.

Klinische Wochenschrift, Berlin

Jan. 22, 1923, **2**, No. 4

*Profession, Standard of Living and Nutrition. O. Kestner.—p. 150.
Distribution of Roentgen Rays in the Depths. H. Holfelder.—p. 154.
*Anesthesia by Acetylene. Gauss and Wieland.—p. 158. Conc'n.
*Misleading Shape of Stomach in Roentgenoscopy. A. Dienstfertig.—*p. 162.
Spasmophilia. P. Reyher.—p. 163. Conc'n No. 5.
*Thyroid and Erythropoiesis. Unverricht.—p. 166.
*Clinical Significance of Experiments on Testes. H. F. O. Haberland.—p. 167.
Formation of Gallstones. W. Bauermeister.—p. 168.
"Glucose Infusions in Heart Disease." Büdingen.—p. 169. Reply. Klewitz.—p. 170.
*Xanthydrol Test for Urea in Kidney. K. Walter.—p. 170.
Blood Concentration After Roentgen Rays. F. Klewitz.—p. 171.
Protein Treatment in Ophthalmology. R. Cords.—p. 171.
*Predisposition to Disease in Schoolchildren. A. Lewandowski.—p. 174.
The Optic Sense of Plants. E. G. Pringsheim.—p. 175.

Profession, Standard of Living and Nutrition.—Kestner reviews the quantitative and qualitative side of the nutrition.

Anesthesia by Acetylene.—Gauss and Wieland report excellent results with the use of acetylene for narcosis. Its action resembles the action of nitrous oxid, which inhibits processes depending on oxygen. They say that acetylene has the same properties, and the further advantage of possibility of a prolonged anesthesia if oxygen is added. The breathing and circulation are not interfered with; the return to consciousness is rapid.

The Outline of the Stomach in Roentgenography.—Dienstfertig emphasizes the necessity of examining the patient from several different directions.

The Thyroid and the Production of Erythrocytes.—Unverricht observed cases of severe simple anemia (chiefly in tuberculous patients) in which arsenic was without therapeutic action. These patients also presented signs of hypothyroidism (dry rough skin, slow psychic action, etc.). The condition improved under thyroid treatment so that arsenic then became effective.

Clinical Significance of Experiments on Testes.—Haberland reports on fifty-six testis grafts in animals. He failed with different methods to obtain a permanent survival of transplanted testes, even when they had been taken from the same animal, and believes that the favorable results reported in men are due to suggestion.

Xanthydrol Reaction in Microchemical Tests for Urea in Kidneys.—Walter injected the kidneys from the aorta with a solution of xanthydrol in glacial acetic acid. The crystals of dixanthylurea were found lodged not only in the lumen of the tubules, but also in the cells of the glomeruli and tubules.

Influence of War on Predisposition to Disease in Schoolchildren.—Lewandowski shows that schoolchildren born during the war (1915 and 1916) suffer much less from infectious diseases than their predecessors.

Jan. 29, 1923, **2**, No. 5

Extra-Pyramidal Motor System. F. H. Lewy.—p. 189.
*Slow Cholangeitis. F. E. R. Loewenhardt.—p. 192.
*Experiments on Eosinophilia. E. Liebreich.—p. 194.
*Spasmophilia. P. Reyher.—p. 198. Conc'n.
*Calcium Retention and Calcification of Vessels. Rabl.—p. 202.
*Kidney Function Test with Thiosulphate. W. Nyiri.—p. 204.
*Changes of Bacilli in Gases. F. H. Lorentz.—p. 206.
"Liver Function Test." H. Wörner.—p. 208.
"Intravenous Needle Electrodes for Electrocardiography." H. Sachs.—p. 209.
*Physical Chemistry of Phagocytosis. R. Höber and Kanai.—p. 209.
*Determination of Uric Acid in Blood Serum. K. Harpuder.—p. 209.
Experimental Research on Changes in Digestion After Operations on Stomach and Intestines. Enderlen et al.—p. 210.
Tuberculosis of Portio Vaginalis. W. Vogel.—p. 211.
Exanthem After Phenobarbital Treatment. R. Herrmann.—p. 212.
Undernutrition in Treatment of Diabetes. S. Isaac.—p. 212.
Milk Hygiene. E. Friedberger.—p. 215.
Metabolism of Cholesterol and Its Clinical Import. Gross.—p. 217.

Slow Cholangeitis.—Loewenhardt separates infectious cholangeitis from the large group of slow septicemias. The history of the patients points usually to a previous hematogenous infection. The disease starts without severe general symptoms. The patient feels weak; has sometimes intestinal trouble; the skin and scleras are subicteric; the fever is remittent or intermittent, and chills occur frequently. The liver is swollen, and a soft enlargement of the spleen is an important sign. The bacteria practically always can be cultivated from the blood, if the attempt is repeated often enough. The treatment consists in drainage of the common bile duct.

Experiments on Eosinophilia.—Liebreich observed an extreme accumulation of eosinophils in one phase of blood coagulation. He gives details of his difficult technic. Charcot-Leyden crystals appear also among the cells. He recalls the fact that the homologous granules are crystalloid in some species, and believes there is a relation of the granule substance to fibrin.

Spasmophilia.—Reyher contends that a disease exists in Germany which is identical with beriberi in infants and the spasmophilic dyspepsia described by Japanese authors. He explains it as a food disorder inducing a tendency to convulsions, and considers it as the basis of so-called spasmophilia. He does not regard the increased mechanical and electric irritability of the nerves as an essential part of the syndrome, but attributes this symptom to loss or lack of calcium (usually due to rachitis). He believes that the hemorrhages in the parathyroids, found sometimes in this condition, are only a manifestation of a general tendency to hemorrhage, similar to the petechiae found in beriberi. Large amounts of vitamin B influence the condition favorably in a short time. He calls it *spasmogene Nährschaden*.

Calcium Retention, Calcification of Vessels, and Function of Kidneys.—Rabl added phosphoric acid to the food of white mice for two days, alternating with alkaline phosphates and some sodium acetate, keeping this up for two or three weeks. The food contained in addition considerable calcium. All the animals showed extensive calcification in the kidneys, heart and stomach. Half of them had similar changes in the lungs and large arteries. The liver, spleen, pancreas and intestine were intact. Animals which received the phosphoric acid alone, had calcification only in the heart and lungs. He concludes, therefore, that the important factors in the genesis of "calcium gout" are changes in the acid and alkali equilibrium during a simultaneous, large calcium intake (by mouth or from the bones). The typical experimental "calcium metastasis" in toxic (sublimate) nephritis could be explained by the lowered ability of such kidneys to maintain the acid-alkali equilibrium. The calcification of the arteries shows that it need not be localized in degenerated parts of arteries. Some renal phosphate calculi may be due to similar conditions.

Kidney Function Test with Thiosulphate.—Nyiri found that a healthy kidney excreted within two or three hours 30 to 40 per cent. of 10 c.c. of a 10 per cent. solution (1 gm. of substance) of sodium thiosulphate injected intravenously. In diseases of the kidneys he found between 0 and 23 per cent.

Changes of Bacilli in Gases.—Lorentz found that oxygen increases the production of toxin by diphtheria bacilli, and inhibits their growth. Carbon dioxid acts in the opposite way. It seems that it increases also the number of positive results of diagnostic cultures.

Physical Chemistry of Phagocytosis.—Höber and Kanai consider the opsonic phenomena more or less as the action of globulins. An increase in the amounts of globulins represents promotion of phagocytosis.

Quantitative Determination of Uric Acid in Blood Serum.—Harpuder's method aims to avoid the errors due to adsorption of uric acid to the blood proteins.

Medizinische Klinik, Berlin

Jan. 21, 1923, **19**, No. 3

*Hemorrhagic Diatheses. P. Morawitz.—p. 71.
Metabolism and Dermatology. E. Pulay.—p. 77.
*Toxic Exanthems and Prognosis of Syphilis. G. Stümpke.—p. 80.
*Extracardiac Murmurs. A. Arnstein.—p. 81.
*Malaria in Berlin. E. Schiff.—p. 84.
*Blood Grouping. K. Meyer and H. Ziskoven.—p. 87.
Disease of Bladder. E. Portner.—p. 89.
Survey of Progress in Roentgen-Ray Diagnosis. L. Freund.—p. 91.

Hemorrhagic Diatheses.—Morawitz emphasizes the need to gather more exactly examined material for the future. The history of the case is very important for the diagnosis of scurvy, in addition to the bleeding gums and the lack of any characteristic changes in the morphology and chemistry of the blood. The curative action of the antiscorbutic diet confirms the diagnosis. The characteristic symptom in hemophilia is the protracted time of coagulation of the blood. The elements of the blood, especially the blood platelets, are normal. The cases with lack of fibrinogen should not be confounded with the pure pathologic entity of hemophilia. The typical heredity is an aid to diagnosis, though there are other hereditary instances of hemorrhagic diatheses with a low number of blood platelets. Critical study reveals that of 300 hemophilic families on which reports have been published, hemophilia is certain in only about forty. The term Werlhof's disease should be reserved for purpuras with abnormally small numbers of blood platelets. While the hemorrhages are restricted to the extremities in a simple purpura, these patients bleed also from the mouth, intestines and kidneys. The critical number of blood platelets seems to be 30,000. Yet the changes in the endothelial cells of the capillaries are also important. It is possible that the spleen has an influence on them, since splenectomy is followed only by a passing increase in blood platelets, but the tendency to hemorrhage may be definitely arrested. Other cases with thrombopenia do not bleed. In all conditions with low numbers of platelets the blood clot does not retract. The simple (or rheumatic) purpura gives the impression of an infectious disease. These hemorrhages are complicated with erythemas, urticaria and transient edemas which, together with the pains in the joints, resemble the symptoms of serum sickness. Actual hemorrhagic nephritis may occur, while there is only a simple bleeding from the kidneys in the thrombopenia purpura. The hemorrhages in infectious diseases do not fit well into the present general outline.

Toxic Exanthems and Prognosis of Syphilis.—Stümpke found recurrence of symptoms of syphilis in seven cases out of eleven that presented an arsphenamin dermatitis. It is, therefore, prognostically not favorable, as was assumed at one time.

Extracardiac Murmurs, Especially from Lung Vessels.—Arnstein publishes a case of a murmur due to a small aneurysm of a branch of the pulmonary artery in bronchiectasia. The patient had a subphrenic abscess, which had perforated a bronchus.

Tropical Malaria in Berlin.—Schiff reports four further cases of tropical malaria. Three of them were probably, one certainly, infected in Berlin. Two of them were syphilitics being treated with arsphenamin.

Blood Grouping.—Meyer and Ziskoven review the question of blood grouping and its practical importance in blood transfusions and transplantations of skin. Since Eden found changes in the iso-agglutinins after different drugs (quinin, calcium lactate, antipyrin, arsenic, ether, chloroform and roentgen rays) they tested this action on twenty-three cases. They did not find any changes, and believe that Eden's findings were due to a mistake with sedimentation of corpuscles.

Jan. 28, 1923, **19**, No. 4

Dementia Praecox. H. Berger.—p. 101.
*Antistreptococcus Serums. F. Meyer and K. Joseph.—p. 103.
Metabolism and Dermatology. E. Pulay.—p. 108. Cont'n.
*Paravertebral Dulness from Enlarged Auricle. A. Leimdörfer.—p. 111.
Severe Case of Botulinus Poisoning. W. Seidelmann.—p. 113.
*Hemophilia and Pituitary Extract. H. Neumann.—p. 115.
Specific Gravity of Small Amounts of Urine. A. Jolles.—p. 115.
Official Estimation of Disability. Wulsten.—p. 116.
*Fight Against Tuberculosis. F. Jessen.—p. 117.
Cheaper Prescriptions. R. Kayser.—p. 120.
Diseases of Bladder. E. Portner.—p. 121.
Present Conceptions of Pain in Muscles and Nerves. K. Singer.—p. 123.

Streptococcus Infection and Antistreptococcus Serums.—Meyer and Joseph confirm five serologically different groups of streptococci. It is evident that a general specific action cannot be expected from univalent serums. The serums have to be repeatedly tested with new strains. Some streptococci produce hemotoxins, which however cannot be kept for more than three days. These toxins are identical in all groups. They do not kill the animal immediately, but cause severe anemia and death within a few weeks. In spite of many difficulties, they were able to produce serums which act not only against the cocci, but also against these toxins. These serums have a curative effect in animals. Colloidal solutions diminish the activity of the toxins.

Paravertebral Dulness from Enlarged Auricle.—Leimdörfer has been studying paravertebral dulness due to enlargement of the left auricle in forty patients. The dulness is marked, especially in decompensated mitral stenosis, and may cover the left interscapular area from the fifth to the ninth thoracic vertebrae. Enlarged lymphatic glands cause usually bilateral areas of dulness and other symptoms. Dilatation and aneurysm of the aorta also have to be excluded.

Hemophilia and Pituitary Extracts.—Neumann reports a case of probable hemophilia. The bleeding from the nose stopped after one local and one subcutaneous application of pituitary extract.

Fight Against Tuberculosis.—Jessen sees in the early diagnosis and treatment of children the safest way to fight tuberculosis. The physician should not wait to make a diagnosis until he finds bacilli. A slight blepharitis, enlarged cervical or peribronchial glands, atrophy of the trapezius, even flushing of one half of the face, or one dilated pupil are signs of beginning tuberculosis if the rectal temperature exceeds 37.2 C. at noon (typical maximum in tuberculosis). Changes of acidity in the gastric juice may be due to pressure from enlarged bronchial glands on the pneumogastric nerve. Lack of progress in school, apparent laziness, may be manifestations of tuberculous intoxication. The paralytic thorax is a sign of tuberculosis, not of a predisposition to it.

Monatsschrift für Geb. und Gynäkologie, Berlin

October, 1922, **60**. G. Winter Festschrift

*Treatment of Placenta Praevia. M. Hofmeier.—p. 3.
*Cervical Implantation of Placenta. Zangemeister and Schilling.—p. 15.
*Practical Importance of Fever at Childbirth. M. Henkel.—p. 58.
The Outlook for Combating Infection. Hammerschlag.—p. 80.
*Bladder Impeding Delivery. E. Sachs.—p. 88.
*Diagnostic Import of Varices in Bladder. P. Rosenstein.—p. 106.
*Pregnancy Pyelitis. B. Rosinski.—p. 116.
*Operative Treatment of Urinary Fistulas. E. Schroeder.—p. 124.
*Cancer of Sigmoid Flexure. Schütze.—p. 130.
*Ventrifixation of the Uterus. H. Fuchs.—p. 133.
The Vagitus Question. C. U. von Klein.—p. 154.
*Experimental Roentgen Injury of Ovaries. F. Unterberger.—p. 164.
*Nonencapsulated Peritonitis in Parturients. W. Benthin.—p. 171.
Genital Tuberculosis. K. Riediger.—p. 225.
*Kidney Findings in Pregnancy. K. Fink.—p. 229.
Internal Examination by Midwives. C. Abernetty.—p. 243.
*Diagnosis of Twin Pregnancy. W. Offermann.—p. 259.
*Intraperitoneal Injections of Ether. H. Naujoks.—p. 265.
Jaundice in the New-Born. Lepehne.—p. 277.
Otitis Media in Pregnancy. A. Blohmke.—p. 291.
Calcified Myoma in Uterus. T. Cohn.—p. 308.
Operative Treatment for Cancer of Uterine Cervix. Gaydoul and Schmitt.—p. 317.

Fetal Movements as for Respiration. W. Walz.—p. 331.
Etiology of Congenital Atresia of Small Intestine. Hennig.—p. 342.
Treatment of General Puerperal Infection. E. Henrard.—p. 347.
*Provocative Procedures in Gonorrhea. E. Müller and C. Richter. —p. 355.
Early Diagnosis of Congenital Heart Defects. H. Wüsthoff.—p. 365.
Works of Prof. G. Winter.—p. 376.

Placenta Praevia.—Hofmeier relates that he has had one case of placenta praevia in each 79 obstetric cases in the last ten years. The death rate was 7.5 per cent. in the total 218 cases. Cesarean section was done in 14, with 21.4 per cent. mortality; embolism in the third week was responsible for one death, and preceding hemorrhages for another. The third fatality might have been averted if supravaginal amputation had followed at once. This should be the routine procedure when the placenta is embedded in the lower segment of the uterus. Generally, the primary embedding is above this segment, and the placenta merely extends down into the lower passage. The danger of fatal hemorrhage with placenta praevia is not so great as usually assumed.

Cervical Implantation of Placenta.—When the placenta develops partially or entirely in the cervix, the vaginal portion of the uterus, or at least one lip of the portio, appears swollen, or one wall of the cervix feels as if it contained a tumor. In multiparas the portio seems abnormally short and varicose veins may be visible. Even a placenta entirely in the cervix does not always present as placenta praevia. The head was sometimes found movable high above the pelvis. The mishaps with cervical placenta have generally been due to the fact that it was not recognized in time. If the bleeding continues, Zangemeister and Schilling advise removing the uterus without delay, as also when infection is suspected. The numerous manipulations usually entail infection.

Practical Import of Fever at Childbirth.—Henkel summarizes his experience in the warning that fever is not an indication to hasten delivery but rather a contraindication. If delivery is hastened, there is need for extra caution to avoid lacerations or contusions.

Bladder Impeding Delivery.—Sachs discusses displacement of the bladder between the uterine ligaments, a lateral cystocele. This must not be mistaken for a cystic tumor. The bladder in this position is also liable to injury in vaginal operations.

Varices in the Bladder.—Rosenstein describes a case in which constipation from a stricture of the anus had caused a puzzling clinical picture and such congestion in the pelvic vessels that varices in the bladder were nearly mistaken for metastases of an intestinal cancer that had been successfully removed. After the stricture had been corrected, the varices in the bladder disappeared. He reports a number of other instances of misleading varices in the bladder.

Pregnancy Pyelitis.—Rosinski's experience demonstrates that women who have had pregnancy pyelitis must be kept under supervision until kidney functioning has returned completely to normal. Evacuation of the uterus is more effective in the severer cases even than nephrotomy. The kidney has been known to recuperate, he adds, after evacuation of 17 liters of contents.

Urinary Fistulas.—Schroeder gives details of nineteen operative cases of vesicovaginal fistulas. He utilized the uterus in closing the gap in six instances.

Cancer of Sigmoid Flexure.—The cancer and stenosis had simulated a tumor in the adnexa in the case reported by Schütze. The woman, aged 38, recovered completely after resection of the intestine with primary suture.

Ventrifixation of the Uterus.—In Fuchs' series of 218 vesicoventrifixations, 37 women subsequently had a total of 47 pregnancies. Delivery was normal and spontaneous in 24; in 4 the placenta had to be detached by hand, and there was transverse presentation in 2. Abortion occurred in 5 cases—about the usual average. Fuchs remarks that even if the fixation was responsible for these anomalies—which is scarcely probable—they are too few to discredit ventrifixation.

Experimental Roentgen Injury of Ovaries.—Unterberger exposed the ovaries of butterflies to the roentgen rays, and noted a decidedly deleterious action on the offspring. They were all abnormally small, and differed in other ways from the standard. He warns of the danger of even mild roentgen irradiation of the ovaries in girls and young women.

Diffuse Peritonitis in Gynecologic and Obstetric Cases.—Benthin presents arguments in favor of local ether treatment, and urges early diagnosis by puncture. The routine procedure, he states, should be simple incision and drainage, without irrigation or mechanical removal of pus or adhesions. With peritonitis from abortion, he insists that no attempt should be made to remove the relics of the ovum; they will be spontaneously expelled. After-treatment is extremely important and includes regulating the fluid intake, the breathing, the heart action, and peristalsis. He gives details of twenty-six cases in which 50 or 100 gm. of ether was injected in prophylaxis. The results indicate, he says, that this is the best method of treatment known to date. The main thing is early diagnosis.

Pregnancy Kidney.—Fink explains that pregnancy albuminuria is merely the expression of instability and irritability of the epithelium. When there is no rise in blood pressure and no edema, it is harmless, and does not require treatment. With pregnancy nephropathy, there is a tendency to stagnation of water throughout the tissues. The kidney parenchyma merely shares in this. Treatment must aim to reduce the retention of water by rest and reduction of the intake of water and salt. If the blood pressure rises, eclampsia may occur. Acute nephritis may develop in the pregnant and require the same treatment as in other conditions. Chronic nephritis may make interruption of the pregnancy necessary if the symptoms become alarming.

Diagnosis of Twin Pregnancy.—Offermann regards difference in the distinctness with which the fetal heart sounds are perceived as a sure sign of twin pregnancy. The heart sounds seem to spread from a single center, but they are like two clocks beating together; one will lag behind the other at times, like the hoof beats of two galloping horses. He calls this the *differenzunreinheit* sign. Another sign is the presence of the umbilical cord murmur at two different points when the heart sounds are heard. The umbilical cord murmur seems to have its origin in the heart.

Experimental Intraperitoneal Injection of Ether.—Naujoks experimented on rabbits. The findings confirm the beneficial action of ether in peritonitis, although it is impossible to apply the findings in these small animals directly to man.

Provocative Procedures in Gonorrhea.—Müller and Richter describe experiences with intravenous injection of glucose solution. It should be supplemented by local measures. This combination proved most effective.

Wiener klinische Wochenschrift, Vienna

Jan. 25, 1923, **36**, No. 4

*Treatment of Sterility in Women. E. Graff.—p. 61.
"Causal" and Teleologic Views in Pathology. R. Meyer.—p. 64.
Determination of the Amount of Blood in Man. I. Piticariu.—p. 68.
Instrument for Lavage of the Bladder. M. Oppenheim.—p. 69.
Treatment of Tuberculosis. J. B. Andreatti.—p. 69. Conc'n.
*Alcohol and School. H. Reichel.—p. 72.
Rokitansky and Scientific Societies. M. Zeissl.—p. 74.

Treatment of Sterility in Women.—Graff prefers examining the sperm from the vagina to the usual condom method. Primary sterility is usually associated with hypoplastic conditions in the sex organs. The only manifestation of this may be irregular menstruation. All surgical measures are useless in these cases. Retroflexion and retroversion of the uterus may be the cause of sterility, though their influence is largely overestimated. Inflammatory conditions in the sex organs must be treated. Gonorrhea is a frequent cause. Rubin's test for permeability of the tubes is very useful. No operation for sterility should be performed without this test. He believes there is an immunity against sperm, and does not consider dyspareunia a cause of sterility.

Alcohol and School.—Reichel deals with the difficulties of antialcohol education. It is not sufficient to teach abstinence; the teacher must show that life is improved by it. The hygienic, economic and moral evils of alcohol should be explained.

Zeitschrift für urologische Chirurgie, Berlin

Feb. 17, 1923, **12**, No. 1-2

*The Accessory Sex Glands. D. Ohmori.—p. 1.
*The Ejaculatory Duct After Prostatectomy. R. Lichtenstern.—p. 32.
*The Technic for Nephrotomy. E. Hagenbach.—p. 40.
Plastic Operations on the Urethra. I. Deutsch.—p. 47.
Hydronephrosis from Developmental Anomalies. W. Tinnemeyer.—p. 50.

Mutual Relations Between Prostate and Seminal Vesicles.—Ohmori analyzes the microscopic and macroscopic findings at necropsy of thirty-three persons succumbing to a variety of diseases. The prostate was found normal in only 21.22 per cent. and the seminal vesicles in only 33.34 per cent. while in 69.6 per cent. of all cases, there never had been any symptoms attracting attention to the accessory sex glands. The prostate after the age of 40 is thus abnormal more frequently than hitherto supposed.

The Ejaculatory Duct After Prostatectomy.—Lichtenstern reports the results of anatomic and clinical research on the behavior of the ejaculatory duct after suprapubic prostatectomy.

Technic of Nephrotomy.—Hagenbach brings the lips of the incision in the kidney together by long suture threads passed directly through the kidney from side to side, tied over a solid support on each side. He uses three such mattress sutures of catgut; the solid supports on each side of the kidney are fat from the kidney or fragments of muscle. This method has been applied in nine cases and there has been no tendency to hemorrhage. The article is illustrated.

Zentralblatt für Chirurgie, Leipzig

Feb. 24, 1923, **50**, No. 8

*Duodenal Ulcer in Relation to Icterus. H. Zoepffel.—p. 297.
Effusion of Chyle into Peritoneal Cavity. G. Golm.—p. 300.
Injuries of Intestinal Wall Caused Presumably by Ascaris Lumbricoides. K. Anrassy and K. Himmelreicher.—p. 302.
Incarcerated Hernia of Intersigmoid Fossa. F. Erkes.—p. 306.
Ossification Disturbances of the Calcaneum. A. Blencke.—p. 308.
Periarterial Sympathectomy in Arteriosclerotic Gangrene. H. Matheis.—p. 309.
Static Coxa Vara. G. Riedel.—p. 312.

Duodenal Ulcer in Relation to Inflammation and Icterus.—Leaving out of consideration the cases in which a gallstone affection coincides with a duodenal ulcer, the appearance of jaundice caused directly by a duodenal ulcer is very rare. The origin of the jaundice is, of course, clear in cases in which an ulcer is located directly at the site of Vater's papilla, or when dense adhesions arising from an ulcer compress the lumen of the common bile duct. In such cases, however, the jaundice will usually be permanent. It is the cases of transient jaundice associated with duodenal ulcer that are obscure. Zoepffel cites three cases in point, from which he concludes that occasionally there occur acute, inflammatory manifestations in chronic peptic ulcers of the stomach and duodenum, which, owing to their seat near the common bile duct may obstruct and cause stagnation of bile and hence jaundice, through blocking of Vater's papilla by edematous swelling. Sometimes, though not necessarily, this is attended by a secondary cholangitis. In many cases, therefore, the duodenal ulcer must be held directly responsible for the bile stasis. Those cases in which adhesions apparently have existed for some time, but in which icterus appears only occasionally, prove that the jaundice was not caused by them but by temporary blocking of the common bile duct from an acute exacerbation of the chronic ulcer.

Zentralblatt für innere Medizin, Leipzig

Jan. 20, 1923, **44**, No. 3

*Treatment of Chronic Constipation. G. Rosenfeld.—p. 34.

Treatment of Chronic Constipation.—Rosenfeld believes that every chronic constipation is due to a spastic condition in the intestines. His treatment consists of foods, such as oat meal, chocolate, etc. This diet improved the constipation even in a patient who was suffering from a carcinoma of the sigmoid flexure. The foods are of the constipating type.

Jan. 27, 1923, **44**, No. 4

*Heredity in Dupuytren's Contracture. J. Löwy.—p. 81.

Heredity in Dupuytren's Contracture.—Löwy has traced this in four generations. Occupation may have an influence on the form of the contracture, and the patient be able to continue his work in spite of the deformity.

Casopis Lekaruv Ceskych, Prague

Jan. 20, 1923, **62**, No. 3

Louis Pasteur. J. Hlava.—p. 53. Idem. K. Weigner.—p. 58.
*"Spontaneous Generation of Microbes." Andrjevski and Vanicek.—p. 60.
*Biochemical Properties of Colon Bacilli. Pirc I.—p. 60.
*Adenoma in Sheep's Lungs Due to Parasites. V. Hofman.—p. 65.

A New Alleged Proof of Spontaneous Generation of Microbes.—Andrjevski and Vanicek found that Sakharoff's alleged "globules colloïdes" are artefacts, and that his alleged proof of spontaneous generation of bacilli is due to lack of asepsis in his research.

Biochemical Properties of Colon Bacilli and Their Relation to Specific Antigenic Reactions.—Pirc finds that the chemical actions of the colon bacillus (fermentation of milk sugar, gas formation from glucose and reduction of neutral red) are more important than its antigenic properties. Attempts to differentiate colon bacilli from other similar micro-organisms by means of agglutination and complement fixation did not give satisfactory results.

Adenoma in Sheep's Lung Due to Parasites.—Hofman surveys the significance of parasites for the formation of tumors, and publishes a description and pictures of an adenoma from the lung of a sheep, which was apparently due to infection by strongyloides.

Jan. 27, 1923, **62**, No. 4

*Persistent Fistular Voice. M. Seemann.—p. 81.
Two Cases of Neurosyphilis. A. Mazacová.—p. 88.
*Three Severe Cases of Inguinal Hernia. Polák.—p. 90.
*Tubercle of Optic Disk and Choroid. J. Janku.—p. 93. Conc'n.

Persistent Fistular Voice.—Seemann publishes the histories of three patients, who retained after puberty the high pitched fistular voice. In all he found marked hypoplasia of the posterior part of the upper opening of the larynx, especially of the aryepiglottic bands. The constitutional factor was demonstrated by the coincidence of the affection in two brothers. Phonetic exercises taught the patients in a few weeks to use the deep pectoral voice.

Three Severe Cases of Inguinal Hernia.—Polák publishes three cases of inguinal hernias with complications. He emphasizes the predominance of the right side in similar conditions, due to the later descent of the right testis.

Tubercle of Optic Disk and Choroid.—Janku completes a study of tubercles of the fundus of the eye, and publishes ten colored illustrations. The chronic affection is comparatively mild but recurs easily, even after specific treatment.

Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

Feb. 17, 1923, **1**, No. 7

*Radiotherapy of Ocular Tuberculosis. C. A. Krull.—p. 630.
*Myoclonic Reflexes as Basis for Epileptic Myoclonus. L. J. J. Muskens.—p. 642.
*Tracheal Cannula from Physiologic Standpoint. P. J. Mink.—p. 650.
*Serodiagnosis of Syphilis. J. van der Hoeden.—p. 655.
*Present Status of Insulin in Treatment of Diabetes. A. Grevenstuk.—p. 665.

Radiotherapy of Ocular Tuberculosis.—Krull asserts that clinical experience has apparently established that the roentgen and radium rays, applied near or to the eye itself, in proper doses, do not injure the eye. Axenfeld has published cases of sarcoma or epithelioma of the interior of the eye which retrogressed under roentgen-ray treatment without serious injury to the choroid or retina, except that cataract developed later. But the cataract was easily removed when the proper time came. Krull gives details of 30 cases of tuberculous processes in the eyes with systematic roentgen-ray treatment at the Amsterdam University eye clinic. In 50 per cent. the effect was favorable, although recurrence of the tuberculous affection was not uncommon. In 2 other cases the progressive disease seemed to have its course slowed; in 5 other cases the effect of the treatment was dubious, and in 8 others no modification was apparent. No injurious by-effects were evident in any instance. The benefit was striking in one case of blepharospasm and tuberculous conjunctivitis of the eyelid, but suggestion may have contributed to the prompt effect. Superficial tuberculous proc-

esses in the choroid responded very favorably to irradiation, as also 4 of the 28 cases of tuberculous iritis. In one case a very superficial necrosis of the cornea followed the exposures, but it soon healed. Radiotherapy seems to be most promising in tuberculous keratoscleritis, indolent tubercle of the iris, and cyclochoroiditis when the affection is stationary or progressing. With 2 or 3 Holzknecht units, repeated at three week intervals, no injury has ever been observed, while the results were often encouraging. The age of Krull's patients ranged from 12 to 57.

Myoclonic Reflexes in Relation to Epilepsy.—Muskens here presents his second report on research with cats. It has demonstrated that we can induce in these animals, by toxic influence, myoclonic and regional spasms which apparently resemble in every respect similar epileptic myoclonic and regional convulsions in man. He used camphor bromid and absinthe for the purpose, and states that we have by this means a simple and easy method for physiologic research on epilepsy. Certain lesions of the central nervous system modified the reaction.

Tracheal Cannula from the Physiologic Aspect.—Mink remarks that when the tracheal cannula is only for temporary use, the physiologic aspect need scarcely be considered. But when it is to be worn a long time, this is very important, and he explains why the usual custom of using as wide a cannula as possible impairs the breathing capacity. In normal conditions, he says, the intratracheal pressure averages 25 mm. of water, but in mouth-breathers, the pressure is only 15 mm. This is one of the reasons why mouth-breathing is so deleterious. A broad tracheal cannula transforms conditions to the mouth-breathing type, a pressure of only 15 mm. or below. There is a kind of valve action in the nose as air enters, and a similar valve action at the vocal cords during expiration. Something of the kind should be provided for intratracheal respiration when it is to be long continued.

Serodiagnosis of Syphilis.—This communication from the central laboratory of the public health service at Utrecht reports the parallel application of three or four serodiagnostic tests to 1,800 serums. The Meinicke turbidity reaction with cholesterol proved more sensitive than any of the others, and seemed to be specific in higher degree. The tenacity with which it persisted under treatment was remarkable. The technic is simple, convenient and often does not take more than an hour. The response is particularly clear as both turbidity and flocculation are involved.

Treatment of Diabetes with Pancreas Extract.—In concluding this long account of the research on insulin and its results, Grevenstuk states that the islands of Langerhans, and not the acini of the pancreas are responsible for the disturbance in sugar metabolism.

Feb. 24, 1923, **1**, No. 8

*Writing Medical Articles. G. van Rijnberk.—p. 742. Conc'n No. 10.
*Prophylaxis of Puerperal Fever. K. de Snoo.—p. 746.
*Nose, Throat and Ears in the Tuberculous. Siemens.—p. 764.
Oat Flakes and Oatmeal in Diabetic Diet. N. Keulemans.—p. 769.
Calcified Hydatid Cyst in Liver. S. J. van Wijhe and E. Hammer.—p. 771.
Case of Epidemic Encephalitis. P. Tak.—p. 773.
Trichlorethylene in Treatment of Trigeminal Neuralgia. E. Laqueur.—p. 775.

Writing Medical Articles.—Van Rijnberk is editor of the *Tijdschrift*, and he says, among other things, that every communication deserves publication which presents a new idea or a new fact or a fact new to the country or race. Dividing the value of the contents of the article by its length, gives the specific gravity of the article. "Too often," he exclaims, "the quotient proves to be less than 1." In the clinical history, he advises striking out every particular which the writer did not make use of himself in his diagnosis, treatment or prognosis. He pleads further that bibliographic references should be given by titles. In conclusion he ventures the statement that what is needed is a better comprehension of the facts already known, instead of piling up more. He says we are being crushed and suffocated with dry single facts. "What a blessing it would be if all the journals of the world would agree not to publish any new facts for ten years, and devote their pages to collective reviews and monographs on the facts already known."

Prophylaxis of Puerperal Fever.—De Snoo is director of the national midwifery college in the Netherlands, and he presents an array of arguments to show that puerperal infection has other origins than those generally accepted, and that the chief danger is from other parturients with puerperal fever. It seems as if a special strain of cocci is developed by passage through other parturients. Women with chronic gonorrhea would theoretically seem to be peculiarly exposed to danger of secondary infection yet he has had no death from puerperal fever in 5,000 obstetric cases in which the shape of the pelvis and the presentation was normal or nearly so, and delivery proceeded spontaneously; and yet many of them had chronic gonorrhea and chronic suppuration from other causes. The danger from these is thus comparatively negligible. Autoinfection from bacteria already present, lurking possibly for years in the genitalia, certainly can occur, but it is exceptional. His tables show that the proportion of cases with fever after internal examination was twice as large when the interval between the internal examination and delivery had been from two to six days (33.3 per cent.) than when the interval had been shorter. Only 6 of the 827 cases with interval of less than twelve hours were pathologic. In 91 cases of placenta praevia, the same influence of the interval was apparent. The only 2 deaths were in women who had been examined internally from two to six days before delivery, and the pathologic cases were far more numerous than in the other group. The only reason why certain careless obstetricians in private practice are liable to have a good record is because their patients are not exposed to contagion from other parturients as they would be in institutions.

Ear, Nose and Throat Affections in the Tuberculous.—Siemens gives a table of data from 1,457 tuberculous inmates of a sanatorium, including 552 men, 667 women and 238 children. Fully 20 per cent. had some existing affection or anomaly in nose, throat or ear; 7 per cent. chronic otitis media.

Acta Chirurgica Scandinavica, Stockholm

1922. Supplement I

*The Elimination of Ether. K. Gramén.—pp. 1-146.

Ether in Blood, Milk, Urine and Breath After Ether Anesthesia.—The first supplement to the *Acta Chirurgica Scandinavica*, 1922, is devoted to Gramén's extensive research in this line and on the acidosis which follows general anesthesia. He worked out a special method for determining the percentage of ether in 1 c.c. of body fluids and in the breath, and tabulates the findings from 700 tests. The child born after the mother has been given ether may show the effect of it. This should be borne in mind in treating the new-born. His experiments further confirmed the decidedly favorable effects of refraining from purgation and reducing the intake of food preliminary to the operation, while at the same time supplying fluids in abundance and warding off anesthesia acidosis by giving glucose and bicarbonate. The vomit after ether anesthesia indicates that there is achylia. The kidneys may show acute damage from the ether; in one fatal case it amounted to intense nephrosis. This may be the explanation of certain tardy fatalities after general anesthesia.

Hospitalstidende, Copenhagen

Feb. 14, 1923, **66**, No. 7

*Transmission of Multiple Sclerosis to Guinea-Pigs. V. Jensen and G. E. Schrøder.—p. 133.
Electrocoagulation for Lupus in Nose and Throat. Vibede.—p. 146.

Experimental Multiple Sclerosis.—Jensen and Schrøder injected nine rabbits and twenty guinea-pigs with blood and spinal fluid from seven patients with multiple sclerosis. The results were constantly negative, except in one case in which spirochetes were found in the spinal cord. Of the six animals injected with these spirochetes, one developed paralysis, and the brain and spinal cord showed lesions resembling those of multiple sclerosis, but no spirochetes could be found in the animal. This one instance confirms the assumption of an infectious etiology, or, at least, that what we call multiple sclerosis may not always have the same origin.